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NOTES ON SWAINSON'S HAWK (*BUTEO SWAINSONI*) IN MONTANA.

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I. NESTING.

SOME twelve years ago Swainson's Hawk, or the Common American Buzzard, was one of the commonest birds breeding in eastern Montana, but has, since then, been greatly reduced in numbers. At the period mentioned, despite incessant persecution, half a dozen inhabited nests might easily be found during any year in my own neighborhood alone; but at the present time the numerous unoccupied nests in the white ash and cottonwood trees, to which their dead or disheartened owners have never returned, bear pathetic testimony to the gradual disappearance of this hawk as a nesting species. Swainson's Buzzard is locally called 'Hen Hawk,' yet the term is a complete misnomer, for in my twenty-three years' experience with the bird I have never observed it to take poultry of any kind, nor have I obtained the slightest evidence that it ever does so. However, if you give a dog a bad name you may hang him, and the unfortunate buzzard, being credited with the misdeeds of the Prairie Falcon, Goshawk, or Harrier, is in a like case. Here, at all events, the parent birds are shot and the young ruthlessly stoned on sight. As I have already stated in 'The Auk' (Vol. XXV, p. 468) Swainson's Hawk is often most indiscreet in its choice of a building site, selecting a low tree by the roadside,

or within a fenced pasture, for its nest, which thus becomes forthwith the cynosure of hostile eyes. My own study of buzzards in their haunts has from this cause been considerably hindered — sometimes abruptly terminated for the time being — by the destruction of the eggs or young of the very birds I wished to keep under observation.

Swainson's Hawk, when seen flying in the distance, resembles a small Golden Eagle, and there are not a few attributes which are common to both species. Among the latter may be mentioned the facts that both pair for life, both shade their young from the hot sun, and both possess a sense of ornamentation which leads them to decorate their nests. The above characteristics are quite probably shared by all members of the sub-genus *Buteo*, but the further fact remains that neither the Golden Eagle nor Swainson's Hawk ever seems to drink water — at least in captivity —, and this exceptional peculiarity suggests a close affinity between them. Like all buzzards, Swainson's Hawk has a lazy, apathetic temperament, usually preying upon the humblest quarry, and permitting unprovoked attacks upon itself by small and weak tormentors. On occasions, however, when hunger presses, or its eyrie is menaced, the bird can display unexpected dash and ferocity. In May, 1905, a Swainson's Hawk that nested by the Yellowstone near the Terry ferryboat crossing, became so bold as to swoop at the passers-by. A prominent flockmaster, owner of the land, was much annoyed by the bird's threatened assaults, and instructed the ferryman to shoot the assailant. Hearing of this, I interceded successfully with the latter, and secured his co-operation to protect the hawks: but we were unable to save their three eggs from a meddlesome shepherd, who removed and ate them. In the Lake District of Cumberland, England, during the summer of 1910, a Common Buzzard (*Buteo buteo*) which differs but little from *B. swainsoni*, also made frequent attacks upon visitors to its haunt. A correspondent of 'Country Life' for June 25, 1910, contributed an account of his experience, describing how he had to take refuge successively under a tree and behind a wall to avoid the "tremendous swoops" of the bird.

As the present article is very long, I forbear to give a detailed description of the remarkable buzzard flocks which occur at the

migration periods. Those interested can find a full account in 'The Auk' (Vol. XXIV, p. 262) of a buzzard invasion which I witnessed on the Powder River, numbering nearly 2000 birds, probably the largest aggregation of these hawks ever recorded. Since the above event, which happened in April 1890, other observers, as well as myself, have seen many smaller flocks of varying numbers, while a small party of only seven birds was observed by me on Sept. 27, 1911; but it may be hoped that the decrease in size of the Montana migration does not afford a true indication of the rate at which this species is diminishing. The earliest date at which I have noted the spring arrival of a Swainson's Hawk was March 14, 1911, and the latest fall lingerer was observed on November 25, 1910.

The nests of *B. swainsoni* are made entirely of sticks, or of sticks combined with other materials, such as sage-brush, wild-rose brambles, and cottonwood or cedar twigs. There may be an elaborate lining of green weeds, or quantities of wool — perhaps only a scanty layer of grass. Some birds line their nests with fresh leaves, which are renewed at intervals, but, in my experience, this does not occur until after the full clutch of eggs has been laid. The parent birds roll back the eggs and replace them on the leaves, which is not a difficult feat, as many nests are almost flat. As the hawk apparently mates for life, the nest, which is very strongly put together, increases in size with the yearly repairs. In my own experience I have known disused nests to be practically intact after a period of seven or eight years. Since 1889, I have seen a great many occupied nests, but only kept notes of fourteen. Of these six were in ash trees, six in cottonwoods, one in a low cedar, and one in a wind-swept pine-top. This last, on a dominant scaur of the pine hills, was the most picturesque of all, but could not, of course, endure long without renewal, and is the only nest I have seen thus exposed.¹ The number of eggs in seven nests was three, in a couple of others two only: one nest was deserted after a single white egg had been laid, and of four the contents were not examined as I did not climb to them. Two fledglings seen in the tree do not necessarily indicate two eggs, as in about half the clutches of three

¹ A photograph of this country was reproduced in 'The Auk,' Vol. XXV, 1908, p. 251.

eggs one is infertile, and may be found in a perfectly intact state after the young are flown. The color of the eggs is variable, but in all sets of three that I have seen, one egg has been entirely white. In a single instance, two of the three eggs were unmarked, greenish white. Some of the other eggs in the eight nests were blotched with chestnut or umber brown, the remainder being merely flecked with scattered dots of these colors. I never found but one heavily marked egg, and that had the whole ground of its upper half almost completely obscured by umber brown. The first part of June is the usual time to find Swainson's Hawk sitting on eggs, but that depends largely on the weather. I have seen an early incubating bird on May 7, and a late one on June 27. The time of incubation is about twenty-five days, but as with the Marsh Hawk, Hoot Owl, etc., the young are often hatched at intervals, so that the eldest may be full-fledged while the youngest is in the fluffy stage. The cock bird will occasionally sit upon the eggs, and I have twice flushed him from them; but, in my experience, such action is unusual, as the male is generally absent foraging for the female. There are recorded instances of Swainson's Hawk occupying the deserted nests of other birds, but all the pairs which I observed built their own nests, and declined to appropriate old nests of their own species. In one case, where a pair were shot at the nest, a second pair built another nest exactly above the first in a succeeding year. This appeared to me to be a curious coincidence, and it was a no less curious sight to see the two great nests, one above the other, in a small ash tree. If bereft of all their eggs, or nestlings, the discouraged hawks desert that nest forever; but, when deprived of the eggs only, they construct a new abode in which the female lays again. Early in May, 1906, a shepherd robbed a Buzzard's nest in a cottonwood of the three eggs, and the Hawks built a new one in a similar nearby tree. On June 1 the pertinacious hen-bird again sat upon three eggs, which were subsequently unmolested. In this respect these hawks differ from a pair of Golden Eagles, which will never forsake an established eyrie save upon the death of one of them.

Of the fourteen nests which I have kept under observation at different times, not one received such close attention as a nest built early in June, 1908, in a distant ranch pasture. This was not

due to my occasional visits, but to the fact that during the whole summer a boy herded a large bunch of horses outside the fence — a part of which had been taken down to enable the animals to come to water. In a cottonwood tree, directly above the water, the buzzards had placed their nest, and in ordinary circumstances would have enjoyed a welcome shade. As it happened, however, this particular tree had been blighted by the unprecedented blizzard of May 20, and remained almost leafless till August, when to my great surprise it was again covered with foliage. Until this happened the buzzard family suffered terribly from the sun's rays, and convincing testimony was afforded of the parents' devotion in shading their offspring. The nest was made entirely of cottonwood sticks, lined with grass roots. With characteristic indiscretion the birds had chosen a decidedly perilous situation, as the herd-boy above mentioned passed directly by the nesting tree, often with a companion, four times a day, besides spending nearly all his time in its immediate vicinity. He naïvely informed me that, before I discovered the nest, he had frequently stoned the incubating Hawk, but without causing her to forsake her eggs. She began to lay about June 14, sat on three typical eggs — two of them brown marked, one pure white but infertile — and on July 9, two nestlings were hatched. A fortnight later, black feathers appeared amidst their white down, and by the end of July they were full feathered except for their downy heads. The young birds as soon as they were able, sat about in the branches, but returned to the nest at night, and also on hot days, during which the parents shaded them. The presence of my wife and self beneath the low tree, or our loud talking, made no difference to the mother's solicitude for their comfort. In my experience the female Swainson's Hawk is one of the boldest and tamest birds at the nest, in marked contradistinction to her timid partner, which can seldom be observed at close range in the breeding season. The nestlings have enormous appetites, and consume more in proportion to their size than any other raptorial bird which I have studied or kept in confinement. When hungry they set up a piercing kitten-like cry until they are supplied with food.

In 1909, the same boy herded the horses, and exactly the same conditions prevailed for the hawks, which commenced nesting

operation earlier than in 1908. On May 15, I watched the cock bird trampling down material in the nest, and soon his mate came to his assistance. After a time, disturbed by my presence, the pair took wing to an almost invisible height, crossing and re-crossing each other in circles. The female began to lay on May 24, and I observed her deposit her third and last egg on May 26. After sitting hard for about twenty minutes, she stood on the nest edge, spread her wings, and gently glided off. Aided by the high wind, she soared in ascending gyrations until lost to view. I now had a good opportunity to examine the nest, which was much enlarged by the addition of cottonwood and choke-cherry sticks. It was thickly lined inside with cottonwood bark, which falls off in great layers from dead trees. The hawks could easily obtain the soft, fibrous, interior strips, and it was this substance that I had seen both birds arranging in the nest. The latter was also adorned at one end with a bunch of green weeds after the fashion of the Golden Eagle. In color two eggs were unmarked greenish white, but the third egg had a large yellowish brown blotch. The immense nest was out of all proportion to the eggs which were placed in one corner. On June 3, the eggs reposed in exactly the same position upon a thick layer of green cottonwood leaves. I cannot leave this part of the subject without referring to the persecution of this hawk by Kingbirds (*Tyrannus tyrannus*) which frequently nest in close proximity to the site chosen by it. In one instance during 1899, a pair of Kingbirds had built their nest in some choke cherries immediately below that of the hawk, which was in an ash tree growing amidst them. Yet another Swainson's hawk, nesting close by, was so unfortunate as to have a pair of Sparrow Hawks (*Falco sparverius phalœna*) domiciled alongside. Neither of the Swainson Hawks could flap out of the nesting tree without being immediately attacked by one or other of these aggressive birds — sometimes by all of them together. In this connection it is interesting to read the following, as quoted from Capt. Charles E. Bendire by Dr. A. K. Fisher,¹ "Lieut. Benson writes me that, after the Arkansas Kingbirds (*Tyrannus verticalis*) began to build, he invariably found one of their nests in any tree that

¹ Hawks and Owls of the United States, p. 73.

contained a Swainson's Hawk's nest. In one case a pair of these birds had placed their nest directly under and but eight or nine inches from that of the hawk." Judging from my own observation, whenever these unlucky hawks left their nests they would be remorselessly harried by the intrepid Arkansas Kingbirds. I have seen one of the latter strike down a young Sparrow Hawk on the wing, which I took home and kept until it had recovered. The buzzard's peculiar flight upon catching the wind gives these small tormentors their opportunity, as she mounts in slow graceful spirals until a mere speck in the blue. When his mate was sitting, I have seen a male Kingbird (*Tyrannus tyrannus*) alight on the hawk's back and be carried round for several seconds, while he vented his rage by pecking at her. No matter how high the hawk might soar, the small aggressor would keep above her, renewing his attacks at intervals until both were lost to view. The hawk responded to each assault by merely giving four sluggish, downward flaps after which she would sail on motionless wings as before. These measured, floating gyrations, with wide expanded wings and tail, induced Forster to call the Common Buzzard of Europe *spiralis*, as pointed out by Seebohm.¹ My brother-in-law once informed me that he had seen a Swainson's Hawk strike in midair an aggressive Kingbird which had thereupon fallen dead to the ground. At the time this seemed to me an incredible assertion, and I supposed he had mistaken the species of hawk; but since witnessing the bunting flight, described later, I am inclined to believe it.

It was my desire to keep these young buzzards of 1909, in confinement and make observations upon them, more especially as regards the spring moult. Accordingly on August 6, I rode to the tree for the purpose of capturing them, but when I was ascending it, they both took wing. The female fledgling flew some distance down the creek, but fortunately the day was too calm for her to rise again from the long grass, and the less active male fluttered into a deep water hole. While I was engaged in capturing and securing the two fledglings in a sack, their distressed mother appeared on the scene, swooped towards me, or hovered above,

¹ British Birds, Vol. 1, p. 121.

uttering long-drawn tremulous mews. When I rode away, bearing her offspring, she followed at a great height. On the morrow we coaxed the young buzzards to sit on the branch of a tree for photographic purposes. An example was then afforded, if it were needed, of the difference made by wind to a bird's flying powers. The strong wind which arose enabled the female to fly clear away, nor could she be recaptured, even on horseback, as she rose easily from the level. I regretted having disregarded my wife's advice to anchor the Hawk by a pair of jesses; which, although rendering her portrait less effective, would have at least prevented her escape. She was presumably rejoined by her mother, who had been seen floating above the ranch. The male made no attempt to emulate his sister, for although hatched at the same time, she surpassed him in development by a week — a parallel case to that of young Golden Eagles. As observed in this instance, the female buzzard acquired the power of flight in twenty-eight days, and the male only after thirty-five days.

The remaining young buzzard was kept in the barn and soon became exceedingly tame. His varied bill of fare consisted of grasshoppers, beef, mice, small birds which the cat happened to catch and frogs. The last he greatly preferred to any other food, and, upon my entering the barn with a frog, flew eagerly to snatch it from my hand without giving me time to shut the door. So voracious was the bird's appetite that he would account for six large frogs at a meal, and was often compelled to disgorge those which he had swallowed whole to avoid being choked. I have known him to devour an entire rattlesnake at one time. The buzzard's manner of feeding is to fly into a corner with his prey, which he conceals from outside curiosity by presenting his back and spreading his wings and tail over it. At the same time he so completely ruffles his feathers that their white bases on the head and neck cause the parts to appear mostly white, and he screams defiantly if approached. In spite of all this precaution, however, as soon as he had finished his meal he would fly to me for a further supply, when he would repeat his antics as before. The above appears to be a characteristic habit of all eagles and buzzards which become tame in captivity, although I have never observed it in wild, nor in freshly caught birds. The buzzard ejects castings

from the mice, birds, and frogs in twenty-four hours after consuming them, but never drinks water — a peculiarity which he shares with captive Golden Eagles as above mentioned.

The young buzzard's cry differed according to his age. When he was quite young it resembled a kitten as stated, but by the end of August, when he was seven weeks old, it became loud and shrill like the scream of a sea-gull, though more piercing. At two months old he developed a musical cry, the appealing tone of which never failed to create a deep impression upon all who heard it. It consisted of four notes insistently repeated like $\bar{E} \check{U}$, $\bar{E} \check{U}$, the second \bar{E} being a half tone lower than the first, and may be described as long sustained wails followed by short staccato notes. While these four notes are difficult to express in words they could be easily reproduced upon the violin, and are not unlike the plaintive but shriller tones of the British Lapwing (*Vanellus vanellus*) when hovering over its breeding grounds. The buzzard commenced this lament whenever my wife or I were present, and continued it as long as either remained with him. The ornithologist Coues did not fail to notice it, and writing of two captive birds remarks: "Both this and the younger one before him had a peculiarly plaintive whistle to signify hunger or a sense of loneliness, a note that was almost musical in intonation."¹

As all the Hawk's wants were supplied, we considered that this must be a baby cry to express recognition of friends and appreciation of their company. This piteous cry only lasted for a month, as on October 5, before the buzzard was quite three months old, he became entirely silent, moped, and fasted for six days in succession. His despondent mood lasted for five weeks, and only once in all that time would the Hawk come to me for food, although he occasionally ate what was brought to him. He seemed quite indifferent to the society of a young Ferruginous Rough-leg (*Archibuteo ferrugineus*) which was confined with him. Here was indeed a change in the former screaming, voracious bird, which, if at liberty, flew boldly to me and clung to my clothing when I appeared with meat. He now shrank into himself, ceased all friendly overtures, and watched his companion feed unmoved. Not until November

¹ Birds of the Northwest, p. 358.

12th did he regain his high spirits and enormous appetite. I, of course, attributed the change to the migration impulse, but although the dejected buzzard escaped during this period he allowed me to retake him after three short flights. From three months old onwards his ordinary call was a very soft low whistle, nor did he ever scream except when pretending to guard his food.

During the winter the buzzard was kept in the house in a large cage, as I thought the barn would be too cold for him. The bird had engaging ways, and when anxious for food, which would be taken either by day or night, descended from his perch to that corner of his cage nearest the kitchen, where he stood whistling softly until supplied. Every evening at sundown he became restless for a few moments, flapped his wings, and made efforts to fly, which is, I believe, a characteristic of most cage birds at roosting time. In sleeping it was quite exceptional for him to put his head under his wing. On calm fine days the buzzard was liberated for out-door exercise but seemed afraid of wandering too far from home. Until he was a year old he had never been known to fly further than about two hundred yards, and only once into a tree when frightened by a dog. In 1909, I noticed the first appearance of Swainson's Hawk on March 28, and on March 30, my tame bird again became subject to a fit of depression.

(To be continued.)

THE FOX SPARROW AS A SONGSTER.

BY ROBERT THOMAS MOORE.

DURING those brief March days, when he slips through our thickets, the Fox Sparrow sings so sweetly that we conclude he is doing his best. Not until we have heard his finished songs leaping out of the Canadian woodlands and sounding a riot of pure joy, as they are tossed from hill to hill, do we realize how much injustice we have done him. For those migrant strains, even at their best, are mere beginnings, the timid tuning up of the vocal instruments for the great song-fest to come. The fact is the migrant songs, which I have heard, lack nearly every quality which makes the finished product the great song it is. Loud as the former seem, their power is as nothing compared to that which propels the northern challenge, even the tone quality is defective, lacking in full depth and roundness, and most vital of all the dancing rhythm with its powerful central accents, which gives the northern songs the expression of irrepressible joy, is entirely absent. To appreciate this, one must go as far as the Magdalen Islands in the Gulf of St. Lawrence, for these islands mark the southern limit of nesting Fox Sparrows.

With this purpose in view, I found myself on June 15, 1911, at Pictou, N. S., ready to take the biweekly steamer across the eighty miles of gulf waters. Much to my surprise neither there nor in Souris, Prince Edward Is., did I happen on a single individual of this species, yet the following day in the Magdalens, only sixty miles farther north, I found it one of the most common birds, exceeded in abundance only by the Savannah Sparrow and the Blackpoll Warbler. From June 16 until July 5, with the exception of six days on Bird Rock, several hours of each twenty-four were spent with the Fox Sparrow and some days were given up to him entirely. During this period we went to various portions of the islands from East Point to Grindstone, a distance of forty miles and more, and the records secured are therefore representative. Each new region brought to light some variations, but these were slight, the main features remaining unchanged. Wherever we

went, as long as we kept to wooded districts, we were bound to find this robust sparrow and there he would be the loudest, most constant and most conspicuous songster. Ubiquitous as he was, it was not an easy matter to secure complete records of his songs. The difficulty was not with his pitch, which is very true, nor with his tones, which are free of "burred notes," but with the contrast of intensity in the songs themselves. These consist of such a variety of extremely loud and soft sounds that one must get within ten feet of the bird to hear every one distinctly, a difficult problem with any songster, especially one rather shy of intrusion near his song-site. Despite this I secured a number of records, most of which (Nos. 4 to 12 inclusive) are exact representations and the rest lacking only insignificant notes. I have also a large number of fragments such as No. 1, which are of almost equal value in determining universal characteristics. Besides these I heard a great number of songs, which so closely resembled records 2, 5 and 9 that it seemed useless to note them. These three records are the most distinctive and are typical of the great majority of Magdalen songs. To this class belonged some of the most beautiful and longest ones I heard, in fact the records do not represent the length of the best Fox Sparrow songs. Some of them were quite intricate and were purposely avoided until the shorter ones had been mastered. At this point the expedition to Bird Rock intervened and our return on July 1 found the song-season on the wane and the songs curtailed to their central themes. Records 6, 7 and 11 are instances of this and all, except 4 and 5, were obtained during this waning period. Nevertheless they are adequate for the purpose of this article, which is to give by the help of their illustrative value some idea of general characteristics, rather than exact musical representations of the best this finch can do.

The song-sites of the Fox Sparrow are conditioned by his habitat. Wherever there are low evergreens massed in dense clumps — and this is the condition of a large part of the Magdalen woodland — there he will be found. It makes no difference whether those clumps abut on inland fields or front the storms on some precipitous headland, out along their edges these sturdy finches are bound to be and will be heard at all times of the day, be it sunlit or foggy. Each individual has his own particular clump and one

1 2 8va *ff*

2 132-f 2-8va *pp ff p*

1a 2-8va *ff*

3 96-f 2-8va *f ff*

4 150-f 2-8va *ff*

5 100-f 2-8va *mf f ff mf* Call notes

6 104-f 2-8va *f ff*

7 104-f 2-8va *f ff*

8 120-f 2-8va *f ff mf*

9 84-f 2-8va *f ff*

11 2-8va 104-f *p ff*

10 126-f 2-8va *mf f ff mf*

11 104-f 2-8va *p ff*

12 2-8va 126-f *v. j f*

13 152-f 2-8va *f ff*

or more song-sites in that clump, so that it is possible to go out day after day and find the same songster and hear the same song. Sometimes his favorite tree is five feet high and sometimes twenty, ordinarily it is ten, and whatever its height, it is usually a spruce and is always on the edge of the clump, now facing an inner open space, or again the outer world and other songsters. His favorite song-position on the tree is its tip. A point a foot below may be chosen, but never the lower branches and by no means the ground.

The last place is the region of his nest and from there no sounds are issued except call-notes. These consist of two kinds quite different from each other and neither musical. The most common is an explosive aspirate, which may be indicated by the syllable 'chech' and is as loud as the call of the Hermit Thrush. The second is a fine, high-pitched note, which closely resembles the call of the Savannah Sparrow. The former is heard much more frequently and in conjunction with the latter is employed to protest against intrusion near the nest. It is to protect his treasures that he drops to earth or else to help his mate in solving nest-problems, but he cannot stay there long; the impulse towards expression is too strong and he is soon back on his song-site.

On the other hand he does not like to sing alone and, if his first three or four efforts are not answered, he will dive back to his mate. In like manner, when several birds are singing, and one suddenly stops, the rest become discouraged and one after another follow him to earth, although they may be a long distance from each other. Down they go together and after a bustling ten minutes with their mates, almost together they return. On several occasions I watched a single bird start a whole song-group. Cautiously he flitted upwards from limb to limb taking a minute to reach the top, then, when a careful survey had convinced him of safety, the bill raised, the eyes filmed and out across the valley rang the dancing challenge. The last note tossed off, the bill dropped again, the eyes brightened to alertness and the head cocked sidewise into a listening attitude. A minute might pass without the challenge being answered, when it was sent once more ringing over the hills so powerfully, that even a human might have heard it a half a mile. Almost always the second challenge brought a response from the opposite hill and thereafter reply and answer shot back

and forth, allowing plenty of time for pause and effect. Soon a third bird seized a moment of silence and turned the duo into a three-cornered affair and once I noted four rusty-coats shooting up their songs alternately like so many rockets from as many hills. This was not a single instance, but the customary way in which after an intermission song was resumed. Of course I do not mean to assert that Fox Sparrows are always so decorous and never interrupt each other, for they do at times during the day and more often at sunset, when there are too many songsters for each to be respectful. Even then the singing is not chorus fashion, for the tendency toward alternation is still preserved, though one bird often begins before another has finished. What I wish to state is this, that each Fox Sparrow is influenced by all others of his kind within hearing, that he certainly listens to their performance, and that this habit of listening has tended to produce an alternation of song, which generally results in the antiphonal effect of answer and reply.

That this influence is something more than mere accident or sentiment, is brought to light when the songs are studied from a musical standpoint. Records 2, 3, 4, 5 and the fragment 1 were sung from the hills surrounding one valley near Grosse Isle by five different birds. No two of these were more than a third of a mile from each other and therefore, if birds have even as good ears as man, within easy hearing distance. Three of their songs, Nos. 1¹, 2 and 3, were secured the same afternoon, when these three birds were taking part in an alternating trio, during which each bird sang, listened and waited his turn. On other afternoons the authors of songs 4 and 5, were heard answering each other for long periods of time and on still others No. 5 answered members of the first trio. Now the interesting fact is this, that all five of these songs are in the *same key*, *Db*, and three of them use precisely the *same sounds* for their three most important notes, those marked by brackets. This phrase, as will be shown later, is the backbone of every song, its loudest portion, and therefore being

¹ This phrase was only a small portion of the song, the rest of which could not be obtained on account of the bird's shyness. However it was the most important part and, as it is identical with the similar portions of Nos. 2 and 5, it seemed worthy of insertion.

heard farthest, is most likely to be exactly imitated. The following day at Grindstone, twenty-five miles from Grosse Isle, songs 6 and 7 were heard in close proximity, using likewise a common key *E^b* minor. In this case the same time and almost identical notes were employed, and yet both notes and key were totally different from those of the Grosse Isle birds. This sort of thing I noticed a number of times, in fact every time the birds of a group sang long enough for me to pitch their songs and secure evidence. For instance records Nos. 8 and 9 are also in a common key and were rendered by birds whose song-sites were close to each other, though the birds were not heard on the same occasion. In the case of bird No. 8 I was witness of an interesting incident. As I was writing down his notes, another Fox Sparrow flew up to a spruce opposite and answered him in the same key and with almost the identical song. After singing it three or four times in an uncertain fashion, he broke out confidently into an entirely different melody, more resembling No. 2, but still keeping in key D of song 8. Unfortunately he stopped singing before I had time to record his song. This was the only occasion when I heard a Fox Sparrow sing two songs, for unlike the Song Sparrow, the Fox seems to have but one and is content to repeat it over and over, making slight additions at the height of the season or reducing it at the end note by note to its melodic skeleton. This case was probably not a clear instance of two songs, but a momentary lapse, merely indicating how one bird is influenced by another and his songs gradually modified. One other case is enlightening, that of Nos. 10 and 11, whose authors answered each other constantly. These two birds did not sing in the same key, yet their songs contain common sounds and are so closely related that one makes a beautiful finish ¹ to the other. Furthermore both of these songs contain trills, very unusual features in the songs of this species. In each of these four groups there were more birds whose songs I was not able to record. Here then were four sets of Fox Sparrows, each set separated by several miles of territory and each exhibiting remarkable similarities within the group and variations without. Just

¹ To show this relation I have placed Song 10 between two renditions of No. 11 and have added an accompaniment which, of course, was not sung by the birds!

as we would expect, the most distant groups display the greatest divergences, the songs of Grindstone, for instance, manifesting a tendency toward ornamentation, such as trills, rests and grace notes and being rendered in four time, whereas the songs of Grosse Isle are plainer and usually in three or five time.

Having noticed these similarities within the groups, we are next concerned to discover those characteristics which are constant in all Fox Sparrow songs. It has already been intimated that he is not at all particular whether there are 2, 3, or 5 eighth notes in a measure; equally indifferent is he to the use of grace notes, dotted notes, staccato notes and trills, which may or may not be present. Sometimes he will satisfy the demands of human music by returning at the close to a note of the common chord, with which he started, or again he will end aimlessly as in records 6 and 7 or ask a positive question as in No. 8. Furthermore he occasionally slips into minor keys (Records 6, 7, and 11), a most unexpected lapse, when one considers what dancing movements of joy his phrases are. But despite this inconstancy there are certain fundamental characteristics which never change. First, the quality of tone is always round and full, like the sound of a clear flute-note. It is not rendered ambiguous by what Mr. Schuyler Matthews calls "burred tones," on the other hand it is not enriched by those over-tones, which make the notes of the Wood Thrush so ethereal. It is decidedly human without touch of heavenly rapture, just a clear full tone, which is precisely the best medium for a message of joy and the most invigorating imaginable. A second invariable characteristic is the medium pitch of the songs and here the Fox Sparrow differs from the Hermit Thrush and many of our greatest songsters, who climb to such shrill heights that one sometimes doubts their sense for beauty.¹ Our more sensible finch does not sing a note which a human being cannot whistle and all of them are pitched in those last two octaves of the piano, which seem to be the most satisfying region for the expression of bird-music. In the third place every song is extremely loud at least in its fundamental sounds, so that it can be heard half a mile. Sometimes the

¹ Nevertheless we must not forget that what is beautiful to our ears, may not be to a bird's, and vice versa.

whole song is loud, as in No. 2, but as a rule only the central phrase while the beginning and end are soft. A fourth characteristic is subject to little change: the rate of time is always fast, and I say this notwithstanding that record No. 9, my slowest record, was sung only about half as fast as No. 13, for the former was in great contrast with the majority of the songs, which ran nearer to the speed of No. 13. Some of the songs, which were not secured, went even faster and were rung off at such extreme speed that they could hardly be imitated by a human whistler. It is this speed which gives the songs their lively character. There is then practically no variation in these four relations,—quality of tone, pitch, intensity and time and these are the fundamental relations of music.

When we come to the study of more general characteristics, we find there are others which are practically constant. As a whole the Fox Sparrow's song may be described as follows: it opens with two 'chechs,' the low call-note, much like the Hermit Thrush's beginning, then the main song starts high and soft and bursts forth into extremely loud sounds, accenting heavily a characteristic falling phrase of three notes and finally ends as soft as it began, but usually at lower pitch. It may also close with two high call-notes of poor musical quality. The opening and closing call-notes are indicated as near as possible to the proper pitch in record No. 5. All the songs of Grosse Isle, at the height of the song-season, except No. 4, possessed them. Their absence from records 2 and 3 is due to the fact that in these the exact pitch could not be determined. These notes are not, however, important, but the central phrase is. It is the most noticeable part of the song and always consists of a sharp drop in pitch from the first note to the second and a subsequent slight rise from the second to the third. The drop may be a 'fifth,' 'fourth,' or 'second,' but the rise is almost invariably a half tone. Each one of the three is accented just as heavily and sung just as loud as the other two and, except in No. 1, each tone is given the same amount of time. Throughout the records this phrase is indicated by brackets above the score. Ninety-five percent of the songs have it, I should judge, and the rest rudimentary traces. In fact it was so characteristic that I got in the habit of disregarding songs that possessed it and recording all that evinced tendencies to do away with it. The result is, I have such records

as No. 7, where the drop is turned into a triplet of three sounds, Nos. 3 and 12 where it is doubled, and Nos. 4 and 8, where it has almost disappeared. These are the only instances and against them I heard hundreds, which were all rendered in the positive way No. 9 is. Indeed all my fragments consist without exception of this fundamental phrase and whatever else could be secured before the bird ceased singing. This phrase was obtained invariably before other sounds, because it stood out so conspicuously. It is always the loudest portion of the songs, if there is any change of intensity, and yet the preluding soft notes never approach it by means of crescendo. When they have danced the melody up to this point, it simply *bursts* with startling suddenness into the phrase, showering extravagant accents on all three notes. Mr. Cheyney has used the rocket illustration to record his impression of the Hermit Thrush's song, but it can be more fitly applied to the Fox Sparrow's, though the rocket in this case travels horizontally. It starts in mid-sky and darting along with scintillating but suppressed power, suddenly flares out with the accompaniment of dazzling light and triumphant sound; then there is a mighty drop and exultant recovery and a final sputter as it leaps into silence.

To use a term of psychology this central theme is the song's *point of orientation* or the part which invariably compels attention first. One might call it the recognition-phrase of the species, certainly for human ears, and possibly for birds'. Over and over again I heard Fox Sparrows' songs far across the hills and always this phrase alone had sufficient carrying power to be audible, yet it was adequate for the immediate identification of the song. And I think it would be an unconscious recognition-note even for bird-students, who are not musical and could not define it in musical terms. Of course more obvious to them would be the loudness of the song, its speed and the flute-like quality of tone. To the birds also it seems fundamental, for as I have shown, it is the only phrase of the song which remains constant. But I have another bit of evidence, which ought to be convincing. During July when all other notes are dropping off with the waning song-season, this central phrase is kept intact to the very last. Records 6 and 7, secured July 3, show this and more so No. 11, obtained the same afternoon. The last contains only one sound more than the three

of the phrase, and yet that one was sung very soft, while the others were propelled with the same power they had been in June. In connection with this I might mention an incident, which may or may not be considered evidence, though it does prove how birds are influenced by songs about them. I had been endeavoring to get near enough to record the softer tones of the shy author of fragment 1. This bird and some of his song-group not recorded, were singing the central phrase in a peculiar jerky fashion, giving the first note twice as much time as the second. After a few minutes a new songster entered the group, who sang these three notes in a hoarse, hard tone and in lower pitch (see record 1A), and sang no other notes whatever. Stealing up, I was astonished to see a Robin uttering the rasping sounds. Instantly he flew away to the next clump of trees and sang the rollicking song of his kind, but still in hoarse quality.

To me the Fox Sparrow stands out as the singer of joy. Many birds are of this kind, but few are to such a degree as this inhabitant of the stunted woodlands of the North. The musical construction indicates it, for instance the dancing rhythm, the major keys, and the speed with which it fairly shoots through the central phrase. But deeper than these are certain qualities in his physical being and character, which make for happiness: his robustness and virility, his excessive activity in all his waking hours. As evidence of his energy it has been stated that he sometimes scratches with both feet in concert, but my observations indicate that he always does this and that this accounts for the clatter he makes among the leaves. At any rate his energy is quite as strenuous as that of his cousin, the Chewink, whether he is tossing the leaves in search of food or defying the northern fog with his buoyant song. Under no circumstances is he depressed! Evidence of this we obtained repeatedly in the Magdalens. Most every day it rained and even when the sun shone, it was a common occurrence for fog to creep in from the sea and resume full sway. Other birds stopped singing, but not the Fox Sparrow! His song rang out just as buoyant and golden as when sunlit; indeed there was a suppressed eagerness about it, as if it were contesting the supremacy of the mist. Now this is surely optimism and, when one takes him all in all, it is as an optimist that he attains highest rank. As such one

must compare him with birds like the Mockingbird, Thrasher and Winter Wren, all of them singers of the joy of life. None of these, famous as they are, possess as fine a tone as the Fox Sparrow's or revel in such matchless melodies. The Mockingbird and the Thrasher repeat over and over insignificant phrases of from two to five notes, until one wearies of waiting for a real melody. Even the rippling melodies of the Winter Wren are spoiled by jerking rhythm and acrobatic antics. But the Fox Sparrow is almost beyond criticism. His is a dignified manner, a big voice, a fine tone, a consummate sense of rhythm and a splendid series of dancing melodies.

Having praised him so much, one must compare him with his great relative, the Song Sparrow, our finest melodist. And here our larger finch must take second place in one thing and that important: he lacks versatility. Each individual has but one song and any song however fine it may be, is bound to weary after much repetition. The Song Sparrow on the other hand is master of innumerable melodies and every one of his kind has a large repertoire. In no other department of music, however, is the Fox Sparrow inferior. His tone is finer, his voice is bigger and pitched lower, so that it is a more mellow medium for the expression of sentiment, and finally his melodies themselves, though not so various, are more elaborate, interesting and affecting. To tell the truth the Fox Sparrow's song is not at all sparrow-like and bears only a faint resemblance to the larger finches. In nearly every way he is more like the Thrushes, particularly the Hermit, with whom he has a remarkable affinity. He chooses the same sort of song-site, he mounts to it in the same cautious way, throughout the song-period he exhibits the same calm dignity and his rusty coat and large size contribute to the striking similarity. The song itself opens with almost identical call-notes, is followed by a similar contrast of soft and loud tones and in a general way is the same sort of prominent, ringing compelling music. Strangest of all the tone quality, though not quite so rich, is so similar that the first few days in the Magdalens, I mistook it at a distance for the Hermit's! Later study of song-construction made it possible for me to distinguish this song at any distance. It is in song-construction that the Hermit is his undoubted master, as he is of all other birds.

The marvelous harmony of his many phrases places him at once in a rank by himself and forces us to drop a dubious comparison. Still the Fox Sparrow is likely to win a more affectionate regard from the majority of bird-lovers, on account of his brighter music, dancing forth as it does in a perfect abandon of joy. At any rate he is the master songster¹ of the Magdalens and particularly acceptable in that sea-world, whose history is bound up with shipwreck and whose customary music is the buzzing of Savannah Sparrow, rasping of Rusty Blackbird, quavering of Wilson's Snipe, pumping of Bittern, rattling of Rail, croak of Raven, and mocking laughter of the Loon.

CONCEALING ACTION OF THE BITTERN (*BOTAURUS LENTIGINOSUS*).

BY WALTER BRADFORD BARROWS.

THE adaptive, concealing or protective coloration of the common Bittern is so well known to all ornithologists and to most other bird lovers that it hardly needs mention here. It is also a matter of common observation that this remarkable bird has the habit of standing motionless for minutes at a time with its legs, body and outstretched neck all in the same line, the bill pointing directly toward the sky. In this position, with the wings and feathers of the trunk pressed closely to the sides, and perhaps the body itself somewhat flattened, the bird, at least from the usual point of view, closely resembles a weather beaten strip of board, a dead and bleached stub, or even a rather bulky last year's stalk of cat-tail flag.

In my own experience this attitude of the Bittern seems to be assumed most often immediately on alighting, and then after holding this rigid position for a few moments it rather quickly

¹ The Hermit Thrush is only locally distributed and uncommon in the Magdalen Islands.

draws down its head and neck into the more graceful position of a feeding heron and proceeds to walk about deliberately in search of food.

A few years ago I had an opportunity of observing closely one of these birds which exhibited a refinement of this concealing action which was entirely new to me and seemed indeed so remarkable that I hesitated to publish it until the literature of the subject had been searched with some care, and effort had been made to detect other individuals using the same device. The observation referred to was made on the campus of the Agricultural College, in Ingham County, Michigan, in August, 1905, on a Bittern which was found in an artificial pond in which water lilies, wild rice, narrow leaved cattails, sedges and some other water plants were growing. The pond was something less than one hundred yards in length and of irregular form, the widest parts, however, not more than fifteen or twenty yards across.

While at work in my office, in the middle of the afternoon, Mr. U. P. Hedrick, then professor of horticulture, came in breathlessly with the information that a large water bird had alighted in the lily pond and could be collected readily if wanted for the museum. Hurrying back with him to the edge of the pool the bird was nowhere to be seen, although we looked carefully in the place where it had been standing less than five minutes before. Skirting the water with some care and scanning every cluster of water plants on the way, we passed completely around the pool, returning at length to the point where we had first reached it, still without discovering the bird. The afternoon was bright and warm with a rather fitful breeze, there were few shrubs about our end of the pond, the water plants were not thick enough to hide a blackbird; it seemed certain that the bird had flown away.

As we stood talking about its disappearance, however, and while I was questioning my friend who is not an ornithologist as to its size, color and action, it suddenly appeared standing motionless and in plain sight at a distance of less than fifty feet, in water only a few inches deep and among scattered cattail flags which were nowhere close enough together to offer any real concealment. The bird, an adult Bittern (*Botaurus lentiginosus*) was in the characteristic erect and rigid attitude already described and so near to us that its yellow iris was distinctly visible.

Apparently both of us discovered the bird at the same instant and involuntarily gave exclamations of surprise that it had not been seen before, while my companion at once declared that it was within a few feet of the spot where he had left it when he came to call me. I told him what the bird was and called his attention to the protective coloration and posture; then, as we stood admiring the bird and his sublime confidence in his invisibility, a light breeze ruffled the surface of the previously calm water and set the cattail flags rustling and nodding as it passed. Instantly the Bittern began to sway gently from side to side with an undulating motion which was most pronounced in the neck but was participated in by the body and even the legs. So obvious was the motion that it was impossible to overlook it, yet when the breeze subsided and the flags became motionless the bird stood as rigid as before and left us wondering whether after all our eyes might not have deceived us.

It occurred to me that the flickering shadows from the swaying flags might have created the illusion and that the rippling water with its broken reflections possibly made it more complete; but another gentle breeze gave us an opportunity to repeat the observation with both these contingencies in mind and there was no escape from the conclusion that the motion of the Bittern was actual, not due to shadows or reflections, or even to the disturbance of the plumage by the wind itself. The bird stood with its back to the wind and its face toward us. We were within a dozen yards of it now and could see distinctly every mark of its rich, brown, black and buff plumage and yet if our eyes were turned away for an instant it was with difficulty that we could pick up the image again, so perfectly did it blend with the surrounding flags and so accurate was the imitation of their waving motion. This was repeated again and again, and when after ten or fifteen minutes we went back to our work, the bird was still standing near the same spot and in the same rigid position although by almost imperceptible steps it had moved a yard or more from its original station.

During the seven years which have elapsed since this occurrence I have improved every opportunity to watch for a repetition of this action, but thus far in vain. Many times I have had Bitterns

within sight and at short range, but the conditions never have been such as to favor the recognition of such motion had it existed. In one instance, in July, 1911, I watched a family of three young Bitterns more than two thirds grown which assumed the upright and rigid attitude as perfectly as the adults, except that they walked about more freely but without relaxing the strained position in the least. All the time, however, they kept their bodies almost completely hidden in the coarse grass and even the necks were so obscured by the tips of the grass that when this was set in motion by the wind I could not tell whether the neck remained quiet or not. The birds in this case occupied a little grass covered island in a muddy pool so that I could not readily get nearer than about thirty yards, and even with a six-power field-glass it was impossible to settle the question.

A somewhat careful examination has been made of American bird literature without finding any reference to this peculiar action, but the search has been by no means thorough. I have also examined such accounts as I could find of the action of the closely related European Bittern (*Botaurus stellaris*) without finding any reference to a similar performance, although the accounts and figures would lead one to believe that in voice and attitude as well as in general habits this bird closely resembles our own.

BIRD MIGRATION FROM THE STANDPOINT OF ITS
PERIODIC ACCURACY.

BY JOHN C. PHILLIPS.

ONE must confess to a feeling of trepidation on entering into such a dangerous field of discussion as bird migration, especially in its theoretical aspect, for perhaps no scientific subject has been so flooded with wild speculation, dogmatic assertions and poetical fancy. This is natural, because the facts cannot fail to come to the notice of every lover of nature, and their æsthetic quality makes them attractive material for thought and discussion.

Bird migration touches many interesting provinces of science, such as zoögeography, geology, meteorology, evolution and comparative psychology. What has recently excited the writer's curiosity is the meaning of the time sense of certain species of birds, especially where such an accurate sense does not seem to be warranted; in a word, where it seems more highly developed than is compatible with adaptive necessity.

In the past decade many of the facts of migration have become common knowledge, but when these facts are completely grasped, and even when the movements of the individual bird have been thoroughly studied, *the* great problem of migration is likely to remain as much unsolved as ever, for the sense on which distant orientation depends, and the instinct which starts the travellers are beyond the reach of our present methods of investigation. Instinct itself is of course the fundamental problem, a problem as deep and obscure as any in the realm of philosophy. Bergson says: "*The intellect is characterized by a natural inability to comprehend life.*" Instinct on the contrary is moulded on the very form of life. While intelligence treats everything mechanically, instinct proceeds so to speak organically. If the consciousness that slumbers in it should awake, if it were wound up into knowledge, instead of being wound off into action, if we could ask and it could reply, it would give up to us the most intimate secrets of life."¹

¹ Bergson, *Creative Evolution*, p. 165.

But though the nature of instinct is so far beyond us, the direction of its efforts can be studied, and as far as the writer can see they are held by students of animal behavior to be of a purposeful and adaptive nature; if not for their present needs, then possibly through persistence they may show a glimpse of what was their past necessity or specialization. Comparing instinct with intuition Bergson says again: "Without intelligence, it (intuition) would have remained in the form of *instinct*, riveted to the special form of its *practical interest* and turned outward by it into movements of locomotion."¹ (*Italics mine.*)

Holmes says: "Salmon begin their up-stream migration, the male frog develops his tendency to clasp the female, birds herald the advent of the breeding season with courtship and song, and the males of many mammals show at this season an unusual degree of belligerency. The change in instinctive behavior during the breeding season may be due to the production of internal secretions which influence the irritability of certain parts of the nervous system, but however caused, it is, like the varying responses to food, water, etc., *pretty closely subservient to the needs of the species.*"² (*Italics mine.*)

In the same vein we might quote from Lloyd Morgan who in contrasting reflex with instinctive actions, says of the latter: "Instinctive activities are those organized trains or sequences of co-ordinated activities which are performed by the individual in common with all members of the same more or less restricted group, in *adaptation to certain circumstances*, oft-recurring or *essential to the continuance of the species.*"³ (*Italics mine.*)

Whether we regard migration as the operation of a pure instinct, or complicate it with reflex action brought about by various tropisms, and even influenced by a certain element of choice (intelligence), we must admit, I think, that its foundation is adaptive and useful. It is true that it is often difficult to see why bird migration has been so persistently carried on, especially in cases where part of the individuals of a species are local in their habits and part are migratory, for no reason that seems a necessity, but this is very

¹ *do.* p. 178.

² Holmes, *The Evolution of Animal Intelligence.*

³ L. Morgan, *Animal Life and Intelligence*, p. 422.

likely analogous in a certain way to evolution of form, which as embryology shows us so well, is forced into the repetition of ancient and disused types.

Professor Wheeler in his book on ants gives a very concise discussion of instinct, with some excellent definitions. He points out various grades of degenerating instincts in these animals, some of which can be brought back into activity under proper conditions. According to him, instinct, "the combination of complexity with automatic fixity," has been studied from four different points of view, ethological, physiological, psychological and metaphysical. We are naturally concerned now mostly with the physiological side.

We must bear in mind that the regularity of instinctive behavior has probably been somewhat exaggerated, and as Jordan says, an instinctive action is subject to variation like all other characteristics of animals.

Individual birds show peculiarities of behavior in nest building, song and other actions. Hodge has shown that a great difference in power of orientation exists for homing pigeons. Also, in animals as high in the scale of life as birds, there cannot fail to be some "power of choice" in almost every stereotyped activity.

This brings us back to our enquiry into the mechanism by which birds are enabled to arrive each year at a given locality at almost exactly the same time. From a physico-chemical standpoint the accuracy of time sense in certain species is little short of marvelous and is well shown in the familiar Baltimore Oriole and the Bobolink, which are both late arrivals in the north. Mr. Brewster very kindly allowed me to see his notes on the arrival of these species at Concord, Massachusetts, for long periods of time. From 1900 to 1911 his earliest record for the Bobolink is May 3, and his latest May 11. For three years the arrival was May 8, and for two years May 7; the average being May 7. Just as remarkable is the Oriole at Concord. From 1900 to 1911, the earliest is May 3 and latest May 14. The average is May 8, and the species appeared twice on this day, twice on the 9th, once on the 7th, and once on the 6th. An earlier period including the years '86, '89, '90, '91 and '93, gives the average date of the Oriole near Boston as May 6, with the greatest variation at six days.

Examples of this great potential accuracy could be multiplied indefinitely, but we will confine ourselves to some of the most striking. Cooke's report of Bird Migration in the years 1884 and 1885 bear out the wonderful uniformity of progression of the Oriole. Cooke says¹: "Were the surface of the earth level and the climate absolutely uniform, birds would arrive at a given place on approximately the same day each year. . . . In the records of the Biological survey the best example of uniformity in arrival is that of the Chimney Swift at New Market, Va., as noted by George M. Neese. The dates of each year from 1884 to 1906 are respectively, April 16, 16, 15, 16, 16, 11, 9, 15, 21, 14, 15, 14, 12, 7, 16, 14, 16, 12, 11, 9, 12, 12, 10."

Dixon² quotes the case of the Puffins which arrive at St. Kilda very regularly on the first day of May, while the Bartailed Godwits reach the south coast of England so near a certain date that the twelfth of May is known as 'Godwit-day.'

Think for a moment what this means; a start from a more or less changeless climate, where environmental stimuli can hardly account for any of the accuracy we have pointed out, with a journey of two thousand miles or more, fraught with innumerable variations in wind, precipitation, food supply, etc., and in the case of these first instances, an arrival at Boston, estimating the total journey to occupy about two months, with an average error of only 9%. This is comparable to a train being thirteen and one-half minutes late in a journey of one hundred miles at forty miles per hour. Yet if we take into consideration that the bird has no watch to start on, we ought really to figure its possible error of spring arrival as the per cent of its total sojourn in winter quarters, plus the time of its northern journey, which total period must be reckoned to be nearly eight months. This gives us an error of only 2.4%. With the case of the Chimney Swift the actual average error as Cooke remarks is only 2.2 days in the whole period of twenty-three years.

It is natural that a very exceptional season, such as the cold May of 1907, may have a very marked effect on bird arrivals.

¹ The Migratory Movements of Birds in Relation to the Weather. Year-book of Dept. of Agric., 1910, p. 386.

² Dixon, The Migration of Birds, 1897. p. 134.

Eifrig's observations at Ottawa, Canada,¹ show that this exceptional season delayed some birds, like the Hummingbird, for two weeks, while other species were very little affected. This, however, only means that the racial accuracy of the species was forcibly interfered with from outside, in some cases far more seriously than in others.

We must, however, now consider another side of the question. So far we have been dealing with 'first arrivals.' What we should like, of course, would be individual arrivals, but until we have some definite information on this point, which can only be supplied by the return of banded birds to nesting sites, we must content ourselves with the consideration of the possible errors in recording first arrivals, and also with the highly interesting 'bulk arrivals,' or dates of greatest frequency of transient migrants.

The question of the error of first arrivals has been discussed by Messrs. Stone and Cooke. Stone found² that many eyes were better than one, and Cooke³ states that where one observer was operating, his dates of first arrival were apt to be over a day late on an average. Cooke's method of averaging migration arrivals⁴ consists in throwing out dates which are more than six days out of the way, his experience teaching him that "birds seldom vary on account of the season more than six days either way from the average date of their arrival." This method may seem to some, as to the writer, rather arbitrary.

Mr. Stone gives a good discussion of the problem of recording early arrivals in the 'Proceedings of the Academy of Natural Sciences of Philadelphia' for 1908. In it he shows that to get at the actual date we must combine the records of many observers at different points a few miles apart, and combine them in certain definite ways, so as to throw out stations in which individual error or incompatibility of surroundings delayed the detection of the species in question. By 'bulk arrival' Mr. Stone means the date on which the species has arrived at half the stations in a given restricted area. He regards the bulk arrival, or greatest frequency as recorded only

¹ Auk, 1908, p. 1.

² Stone, W., Condor, 1906, p. 88.

³ Cooke, W. W., Auk, 1907, p. 346.

⁴ Cooke, W. W., Auk, 1908, p. 485.

by a single observer, as much too variable a quantity to be of practical use. By his methods of estimating the dates from year to year he obtains an extraordinarily slight arrival variation.

Thus it is probable that ordinary dates of arrival as given by single observers increase rather than diminish our knowledge of the actual potential accuracy of the species.

In 'Cassinia' for 1911 arrivals in the Philadelphia region are tabulated for the years 1906-1911. Below are given in a table four species which are remarkable from our point of view. The figures are the actual departure in days from a ten year average for the species. They are based on Mr. Stone's 'bulk arrival.'

	1906	1907	1908	1909	1910	1911
Yellow Warbler	0	0	+4	-2	0	0
Ovenbird	0	0	+4	-1	0	-2
Baltimore Oriole	+2	-5	+4	-1	-3	-2
Canadian Warbler	0	0	-1	+1	-3	+1

In glancing down the 'Cassinia' table one sees immediately that groups of species arriving at nearly the same time are often very similarly affected by the season, and will be either late or early according to the year. Within the same year, however, the early or March migrants may be affected in an opposite direction from the late migrants; thus early species may be late and late species early, for the same season. This is merely more evidence to show that at least some of the observed arrival error is meteorological rather than instinctive; and external instead of internal.

In the same paper Mr. Stone notes that in computing the ten year averages it is interesting to see how the average of 'bulk arrivals' based on the method given above, coincides with the average of first arrivals at stations where there have been a number of accurate observers. On page 47 is a table which shows the 10 observation stations near Philadelphia, with dates of arrival for 9 common birds. The 'bulk arrivals' here are either the same or only *one* day later than the average first arrivals.

Taking a single species, the Brown Thrasher, a bird easily seen and almost impossible to identify wrongly, the ten year arrival records are given in detail. For this period there are 10 stations and 22 observers at work. Each of the stations has its own average and the greatest error is +2 days at George School, and -3 days

at Concordville. The Grand Total is April 22 for first arrival, while the grand computed 'bulk arrival' is April 23 for the entire period. This shows that first arrivals are not mere stragglers, for if they were, the records of the different Philadelphia stations would not give such uniform results.

In Stone's 'The birds of Eastern Pennsylvania and New Jersey, 1894' are given lists of arrival at Germantown, Pa., for 50 species from 1885 to 1892. Those showing great constancy are the Chimney Swift, Baltimore Oriole, Barn Swallow, Yellow Warbler, Blackpoll Warbler, Oven-bird, Redstart and Catbird. These records of course are not the work of so many observers as the 'Cassinia' records.

For the period 1893-1900 there is another set of arrival records¹ which shows as very accurate birds, the Chimney Swift, Baltimore Oriole, Barn Swallow, Wood Thrush and others. We note that the same species come up with accuracy performances at different times and in different localities.

Mr. Brewster² has called attention to the probable dependence of species upon each other for purposes of guidance. He shows how flocks are made up of many species and how rare stragglers are always found in the company of other species. He also mentions the case of lost birds, that is, rare stragglers, almost always turning out to be the young of the season. It is of course apparent that many species migrate together. On the great May rush several species arrive each day on an average. From the 'Cassinia' table of 1911 we get 4 species on May 4, 2 May 5, 2 May 6, 1 May 7, 5 May 8, 2 May 9, 1 May 10, 2 May 11 and 2 May 12. This refers to common species only, exact dates for rare birds being much harder to compute. But however dependent species are upon each other during their journeys, we cannot escape from the fact that each has its characteristic time period, for if it did not, we would get a very different picture of migration. The birds would then come in great scattering waves, transient migrants would be longer in passing a given point, and the whole phenomenon would lose much of its present orderliness. Of the 14 common Hunga-

¹ Cassinia, 1901, p. 37.

² Memoirs of the Nuttall Club, No. 1, 1886.

rian migrants to be referred to later, no two fall upon the same day. They begin with *Alauda arvensis* on February 28 and end with *Coturnix coturnix* on April 29.

There is much to be learned as to the nesting localities of late and early arrivals inside a given species. It is certain that some birds wintering in Central America arrive in temperate summer haunts and begin nest building almost before others of the same species start from winter quarters bound for sub-arctic regions, the north bound birds starting later and traveling faster.

As Cooke remarks in speaking of the Robin¹ "The first robins that reach a given locality in the spring are likely to remain there to nest, and the advance of the migration time must await the arrival of other birds from still farther south. Therefore each robin undoubtedly migrates at a faster rate than the apparent movement of his species as a whole. This is true of most, if not all, of the other seemingly slow migrants."

We may now refer to the most elaborate study of migration yet attempted, that outlined by Otto Herman in Hungary² and given in 'Aquila' from year to year. Enormous numbers of stations are in use and stress is laid on the common species. It must be confessed however that the actual significance of these records from our point of view is hard to determine because most of the observers appear to have been masters of elementary schools and others not skilled in field work. It is more than likely that many stations would show a delay in arrival not actually present. In Vol. XII, 1905, p. 226, there is, however, a table showing the combined dates of arrival of 16 species from 1894 to 1903. The average yearly error, as compared with a ten year mean date of arrival, has been computed, and shows as very constant birds the following species: *Turtur turtur* and *Oriolus oriolus* with an error of 1.5 days and *Coturnix coturnix* with an error of only 1.4 days.

I have computed the average error of these same species for a later period, 1904 to 1910, using the 'Aquila' tables and find it to be 2.2 days for *Turtur*, and 2 days each for *Oriolus* and *Coturnix*.

Vol. XVIII, 1911, of 'Aquila' gives on p. 138 a large table show-

¹ Yearbook of Dept. of Agriculture, 1903, p. 383.

² Proc. 4, International Ornith. Congress, p. 163.

ing 15 years of work summed up, with actual numbers of individuals included in five day intervals. A rough idea of dates of greatest abundance is thus obtained. These 15 year bulk arrivals are compared directly with the results of the previous year 1910. On the whole this table shows a pretty orderly invasion and departure for each species, although of course the country covered is a large one with much mountainous territory, naturally tending to lengthen out the passage of migrants a great deal above what it would be if a small area had been used for tabular work.

Another way of getting some light on the orderliness of the species in migration is by comparing in a long series of years actual first arrivals with average first arrivals. In Cooke's various papers in 'Bird Lore' on the migration of N. A. Sparrows there is a large number of such records. We will take only a few of the most striking cases where observations extend over a long period, so as to get the greatest possible chance for departures from the normal.

Rose-breasted Grosbeak at Wasington, D. C., 18 years; earliest, May 1; average May 5. For the same species observed at Englewood, N. J., 12 years; earliest, May 1; average May 6. Ballston Spa, N. Y., 14 years; earliest, May 4; average May 10. St. Johnsbury, Vt., 12 years; earliest, May 6; average May 10. Chicago, Ill., 21 years; earliest, April 25; average May 3. Watterloo, Ind., 11 years; earliest, April 28, average May 2. Aweme, Manitoba, 16 years; earliest, May 12, average, May 16.

For the White-crowned Sparrow at Ottawa, Ontario, 24 years; earliest, April 30; average, May 7. For the White-throated Sparrow at Ottawa, Ontario, 27 years; earliest, April 15; average, April 26.

For the Blue Grossbeak at Raleigh, N. C., 21 years; earliest, April 25; average May 2. St. Onaga, Kan., 15 years; earliest, May 1; average May 5.

Indigo Bunting at Raleigh, N. C., 23 years; earliest, April 23; average, May 1. Renovo, Pa., 16 years; earliest, May 2, average May 9.

In thus considering a biologic problem such as migration, it is as well to remark here that we are laying ourselves open to the just criticism which biometricians incur when they rely solely on figures. This we realize fully. Perhaps data from individual birds, which

will one day be forthcoming, will show us that we have greatly exaggerated the individual potential accuracy, but on the other hand may it not be possible that in some cases we have underestimated the case, for as suggested above the first arrivals of a species flight may prove to be always the same birds, bound for a definite latitude and locality.

From Cooke¹ we get the impression that birds cannot in any way predict weather conditions, as has so often been claimed for them, and that such birds as the ducks and geese are much more liable to take advantage of weather conditions, open water, etc., than are the passerine birds. And were this accuracy of the passerines correlated in any way with an increased intelligence, we would certainly expect to see it manifested in birds like the Canada Goose and the ducks, whose superior mental endowment none can doubt. But here we seem to see it least, for in the migration of these independent fowl there is often an error of weeks as contrasted with days among their more trustful and less intelligent brethren. Has not this very intelligence tended in some subtle way to deliver the geese from the bondage, so to speak, of a hide-bound time sense, and allowed them a greater scope to grapple with seasonal conditions? This has nothing to do with the evolution of the species considered: it simply means specialization in a given direction. So also it seems to the writer that the 'potential accuracy' of birds like our Bluebird is probably much greater than we think, but the species is subjected to such a grave variation in season on account of its early arrival in the north, that it, so to speak, does merely the best it can.

Another question occurs at this point, which is really not within our enquiry, but may be mentioned, and that is the reason for the widely different migration times of different species.

Loomis² saw in this phenomenon an indication of an orderly depopulation of the North in order to prevent over-population, and he attributed all that we see now to an equalization of distribution through diversity in the time of southern migration, evolved by the progress of ages and perpetuated by the require-

¹ W. W. Cooke, Yearbook of the Dept. of Agriculture, 1910.

² Auk, 1894, p. 94, Loomis, L. M.

ments of winter. In other words, a huge and far-extending altruism, with nothing left to chance or to orthogenetic tendencies. This view is, I think, farfetched, for one cannot see how the earliest spring movements are the necessary outcome of a rush to occupy all available territory. We should suppose that many more birds could migrate at the same time without disturbing the geographical economy of seasonal dispersal.

Loomis saw in the case of the Canada Goose a continuous migration, not subject to a sudden arousing of the migratory impulse. The impelling force came in this case, he thought, more from without. But here it seems he is only partly right, for this species is certainly subject to great and sudden migratory impulses, only, as we have mentioned above, there is added an element of choice, or an ability to profit by external conditions which is not often easy to see in other birds.

Loomis's various papers in 'The Auk,' in so far as they refer to the erratic movements of birds, and peculiar periodic dispersals, are very interesting, but cannot be considered here. See also an instructive paper by Whitaker on the great invasion of southern Europe by Crossbills in 1909.¹ Even such cases of sporadic invasion of new territory may show an orderly progress and just as orderly retirement.

Many theories of course have been put forward to account for the start of vernal migrants from winter quarters. An ingenious one is that of Taverner², who saw in the breeding of tropical species an actual stimulus to wintering migrants. This stimulus was, he thought, brought about by pressure of numbers and lack of food owing to increase in resident numbers by their early breeding, the pressure extending outwards (northwards) to the limits of populated ground. Other writers have seen in the failure of the food supply in the South after the advent of the dry season, a sufficient inciting cause, but it is hardly probable that any of these reasons could account entirely for the orderly procession of different species, and their appearance at allotted times.

It remains to search for other examples of a physico-chemical

¹ Whitaker, J. I. S., *Auk*, 1910, p. 332.

² *Auk*, 1904, p. 322.

periodicity to compare our time sense with. There occurs to one immediately the phenomenon of ovulation and menstruation in man, and the appearance of rut in other mammals. But such appearances are notoriously liable to time error, and easily affected by changed conditions, disease, season, etc. Variation in periods of gestation and incubation are, it is true, extremely close to the mean for the species, but these periods are coupled and timed by very marked changes in circulation and metabolism, and are scarcely comparable with the migrating period of the bird, which has nothing but the very doubtful stimulus of the developing sex glands to check and control the migration once it has started, and even this is sometimes not present at all. I use the word 'nothing' as meaning nothing that we know of at present. It would indeed be interesting if we could subject castrated birds to experimental conditions in order to test the strength of their migratory impulses, but this could hardly be accomplished. All we know is that young birds belonging to migratory species, though they do not themselves breed during their first year, come north with the others, perhaps by imitation.

We acknowledge the dominating power of sexual 'hormones' in instituting spring migration in birds, for the instinct of reproduction is the dominant instinct in animals, and all others may be classed as secondary to it. What we cannot account for is the controlling and regulating power which must be constantly at work once the journey is begun, in order that a certain latitude may be reached at a certain time.

For instance among warblers Cooke tells us¹ that the Black and White Warbler, an early migrant, occupies a whole month in going from North Carolina to Massachusetts, averaging only 13 miles per day, while the Blackpoll Warblers that nest in Alaska make the last part of their journey, 2500 miles, in not over two weeks, or about 200 miles a day. Some Yellow Warblers accomplish the last part of their journey to Great Slave Lake more than twice as fast as the average advance of spring over the same region. From New Orleans to Great Slave Lake they are continually meeting colder weather. Even the same species shows very different rates of advance in different parts of the country.

¹ Chapman's 'The Warblers of North America.' 1907.

We have, it must be said, various other periodic reflexes, dependent on feeding habits, the diurnal movements of lower organisms following the light, and the tidal movements of various littoral creatures, with very likely a host of others. But none of these so far as I am aware exactly fits our case in birds. In fish, it is true, especially in the salmon family, we see an accurate periodic movement, often begun months before the spawning time, and therefore hardly carried out alone by a direct stimulus from developing eggs or milt. Ocean fish, like the herring of Europe, show characteristic spawning times and spawning places for each closely related race. Bats and fur-seals among mammals are other examples but as to the accuracy of arrival of these animals I am not informed.

I think it is plain, then, that the migratory impulse in birds is not to be explained on the basis of a purely physico-chemical response to an internal secretion, at least not that phase of it which pertains to potential accuracy. This may be a part but not the whole story. Nor does one wish to drag in by the heels any question of intelligent effort, for this would not help us in the least, and would tend to diminish rather than increase the time sense. I say *diminish* because instinct appears so much more mechanical, regular and blind than intelligence ever does.

If one accepts Darwinism in so far as it applies to the selective value of useful variations, it seems hard to see how this chronometer-like accuracy can have been evolved; or even assuming it to have arisen through an adaptive necessity, it is still harder to see why it should remain in its present perfection, for the most enthusiastic Darwinian could scarcely picture it as a matter of great moment to the species if it arrived one week early or one week late, with the whole season before it. We must grant of course one great source of error in our conception of potential accuracy, for as stated above, we are forced to deal with groups instead of individuals; still with a long series of years it seems as if one might gain a pretty correct impression of the accuracy of the individual bird itself.

The writer is familiar only in a general way with the subject at hand, and has merely attempted to call attention to an aspect of migration which does not seem to have been much discussed. Whether it is even worth discussing in the light of our scant knowl-

edge of instinctive actions and their causes is doubtful. With the masses of facts being brought constantly to light relative to bird travels, we are perhaps a little apt to lose sight of some of the old time mystery of the subject. The modern tendency seems to be to sniff at the word 'mystery' as applied to any phenomenon of bird migration. This is merely a question of where the word is applied; if to the actual facts, then it is hardly warranted, but if to the causes, then it is certainly as applicable now as ever. Supposing the facts all at hand, what would the student know about the actual inherent impetus, the heritability of instinct, or the powers of orientation and their mechanism? Would he be one whit better off than the present day systematist who with all his finely cut races does not really know how or why a new species arises?

Mystery there certainly is, and mystery there will always be as long as *the* great biologic problems remain unsolved. The formation and maintenance of this time sense is only one of those activities of nature which tend to make the sternest advocate of mechanism doubtful of its all-sufficiency. It is so much easier to find behind that clock-like movement a vital impetus, 'a guiding unity.'

"It (the evolution of life) is a creation that goes on for ever in virtue of an initial movement. This movement constitutes the unity of the organized world—a prolific unity, of an infinite richness, superior to any that the intellect could dream of, for the intellect is only one of its aspects or products." (Bergson.)

THE RELATION OF BIRD MIGRATION TO THE WEATHER.

BY WELLS W. COOKE.

THE belief is quite general that there is a close connection between the weather and bird migration; that if the weather is not the cause of migration, it is at least the most important, indeed the governing, factor in determining the time of the bird's arrival, and particularly in causing the variations from year to year. The intimate relation supposed to exist between the weather and the bird's movements is thus promulgated by a very acute migration observer who wrote me: "I have collected such a large number of dates for our common birds that if you give me a good account of the weather conditions, I can give you the dates of arrival and movements of many species without going into the field." After an exhaustive study and comparison of bird arrivals with the accompanying weather, the results were found to be so utterly at variance with the above quoted opinion, that they were summarized as follows: "The weather encountered en route influences migration in a subordinate way, retarding or accelerating the birds' advance by only a few days and having slight relation to the date of arrival at the nesting site. Local weather conditions on the day of arrival at any given locality are minor factors in determining the appearance of a species at that place and time. The major factors in the problem are the weather conditions far to the southward, where the night's flight began, and the relation which that place and time bear to the average position of the bird under normal weather conditions."

The above quotation is from an article that was written for the yearbook of the Department of Agriculture for 1910. In its necessarily condensed form, there was opportunity for nothing more than a mere statement of conclusions, without any of the data on which those conclusions were based. It seems advisable that a synopsis of the more important of these data should be published as a contribution to knowledge of the phenomena of bird migration.

For the solution of the proposed problem it is necessary to have the notes of a thoroughly reliable and competent observer, who is

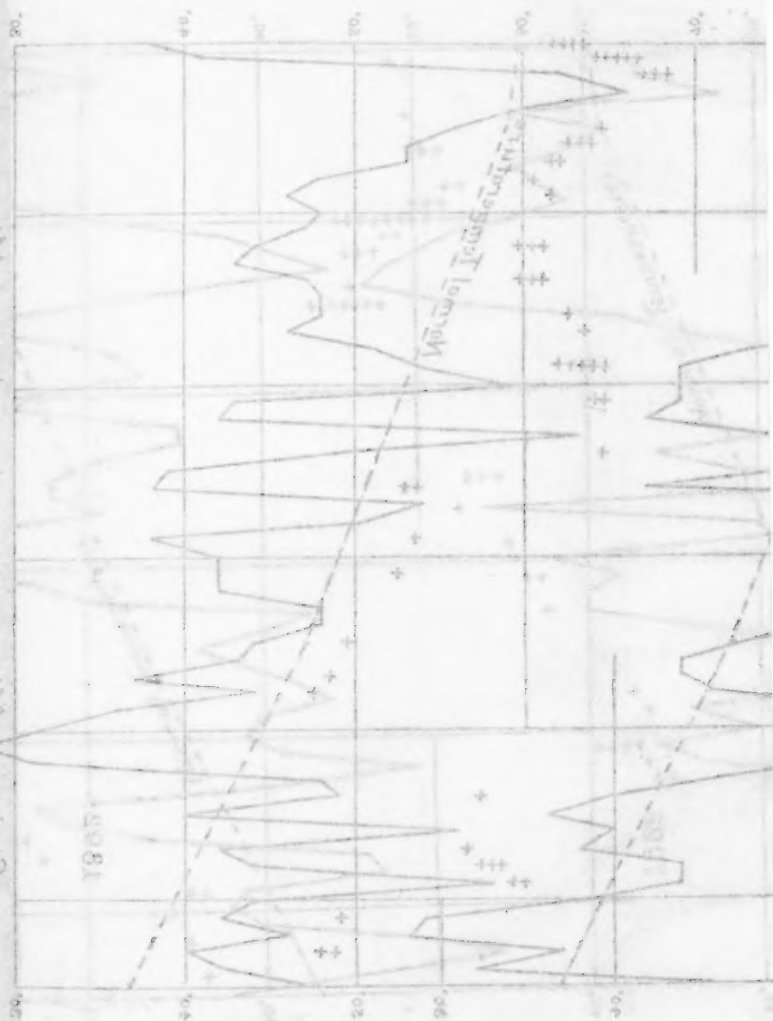
constantly in the field so as to note the birds immediately on their arrival; it is also necessary that these observations be continued long enough to make possible the computation of reliable averages. A great advantage would be to have these records taken in a district free from mountains, valleys, or any other physical features that would tend to interfere with the free and uninterrupted northward movement of migration. The fulfilment of all these conditions was found in the work of Dr. J. C. Hvoslef at Lanesboro, Minnesota. An ardent student of bird life, a close observer with a good knowledge of birds, his profession as a physician with a large country practice, kept him daily in the field and made it probable, that few birds would escape his acute observation. Dr. Hvoslef contributed migration records for ten consecutive years, 1884-1893. At the same time notes were received from several towns in Iowa — notably Grinnell, Iowa City and Coralville — whose records are especially valuable as supplementary and corroborative evidence.

As is well known the weather comes usually in alternate cold and warm waves. If therefore the weather is the controlling factor in bird migration, then the progress of migration should be in waves corresponding to those of the weather, birds arriving freely when the temperature rises above normal and checking their advance when it falls below. While a sort of general correlation can be noted between the waves of weather and migration, the exceptions are many and striking. The accompanying chart gives the course of the weather and migration for three years at Lanesboro, Minnesota. The first year, 1885, shows two pronounced waves of bird arrival coinciding with two waves of decided warm weather; it also shows the biggest migration wave of the whole season coming at the coldest part of a sharp cold snap that sent the temperature far below normal. The second year, 1889, shows a close agreement between the larger waves of migration and the warmer waves of temperature. The third year, 1892, shows all the large bird movements as occurring not on account of the weather but in spite of it.

The bird wave of May 7, 1885, is particularly to be noted. On this day a storm of snow with a north wind forced the temperature below the freezing point, yet on the morning of May 7 "the woods and river bottoms seemed to be almost alive with small birds." Among these were the following seen for the first time:

MIN. OROGRAPH TO MONTAGN BRIG

The above map shows the general character of the country in the neighbourhood of the town of Montagny. The map is drawn from a plan of the country, and is intended to show the general character of the country, and not the details of the topography.



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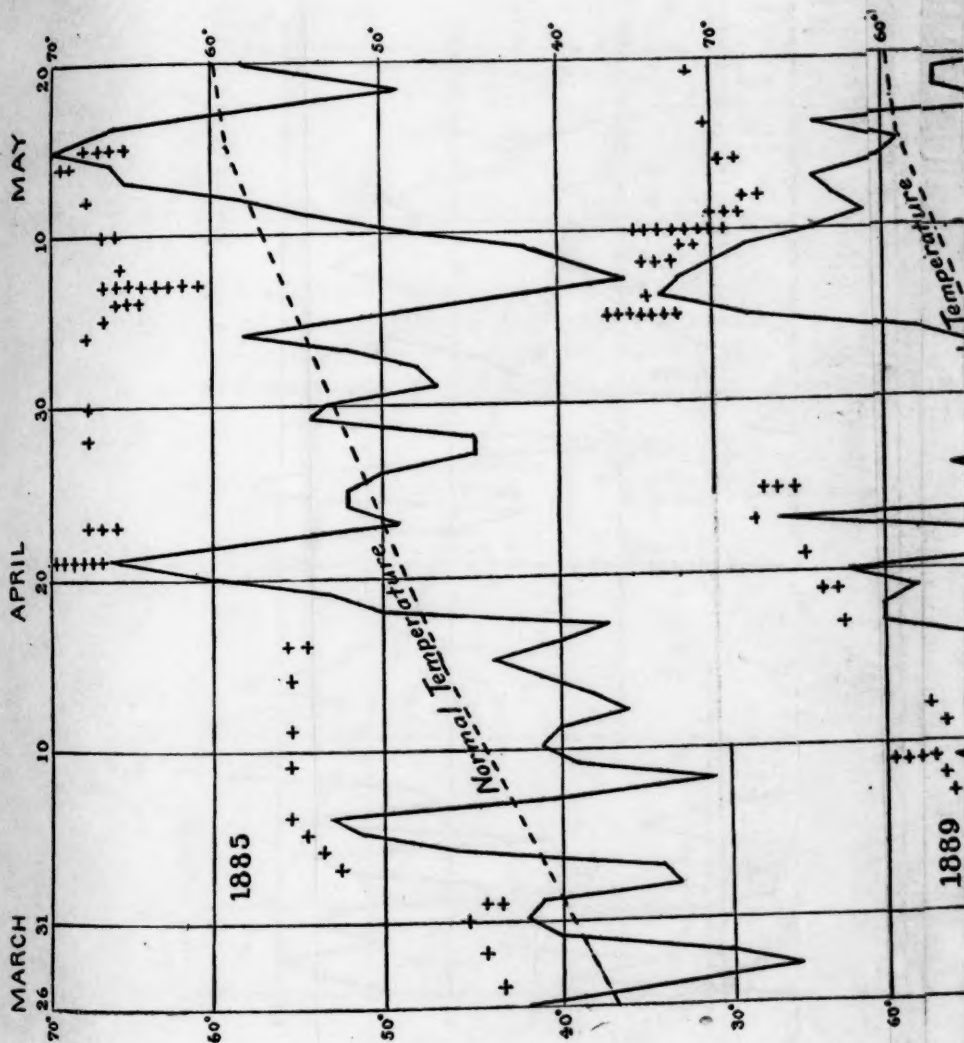
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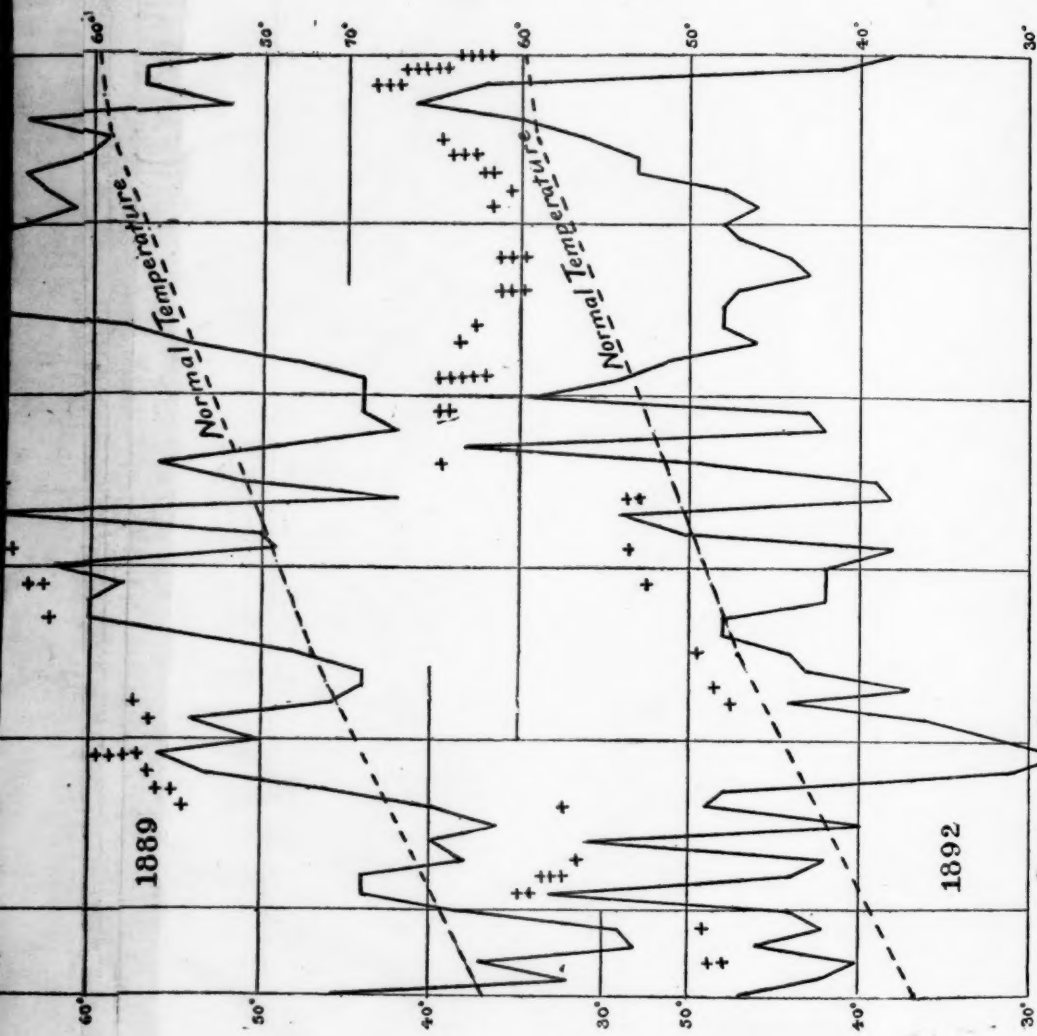
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Spring Migration at Lanesboro, Minn.

The heavy lines show fluctuations in temperature. The crosses show bird arrivals. Each cross represents the arrival of a species not previously noted that year.

Catbird	average date of arrival May 6
Water-Thrush	" " " " " 6
Black-throated Green Warbler	" " " " " 7
Wilson's Warbler	" " " " " 8
Veery	" " " " " 8
Solitary Vireo	" " " " " 8
Nashville Warbler	" " " " " 9
Scarlet Tanager	" " " " " 10
Rose-breasted Grosbeak	" " " " " 10
Tennessee Warbler	" " " " " 11

A queer state of affairs is witnessed in the spring of 1892 when the temperature for a large part of the migration season was decidedly below the average. The birds arrived late but even then did not wait until the temperature had arisen to their normal.

Species.	Arrived later than the average.	Arrived at a temper- ature lower than the average.
	days.	degrees F.
Black and White Warbler	2	8
Lincoln's Sparrow	0	9
Ovenbird	2	13
Water-Thrush	0	9
Kingbird	5	10
Warbling Vireo	13	
Chestnut-sided Warbler	12	
Maryland Yellow-throat	7	6
Catbird	1	13
Yellow Warbler	10	
Wilson's Warbler	11	
Veery	6	4
Olive-backed Thrush	0	13
Red-eyed Vireo	9	
Indigo Bunting	13	
Scarlet Tanager	8	
Magnolia Warbler	11	
Tennessee Warbler	9	
Redstart	7	
Nighthawk	10	
Gray-cheeked Thrush	2	

As proof that birds are not dependent on any exact temperature for their time of migration, it can be stated that birds do not move north in the spring as soon as the temperature rises to the degree of warmth at which they ordinarily migrate. Thus the Baltimore Oriole arrives at Lanesboro, Minn., at an average temperature of about 55° F. but it does not make its appearance as soon as the temperature has risen to this point. The Oriole was not noted at Lanesboro before May 1 in any of the years from 1884 to 1893, though in 1884 a temperature of 55° F. was attained on April 25, in 1885 on April 20, and in the following years on April 9, April 8, April 26, April 9, April 11, April 13, April 1, and April 3. During the spring of 1886, the temperature from April 13 to April 23 averaged 65° F. but no Orioles appeared.

On the other hand, birds do not always wait for their average temperature before they migrate. In 1893 there had been no three consecutive days during the whole spring with as high a temperature as 55° F. when the Baltimore Oriole arrived at Lanesboro, and during the previous two weeks no temperature higher than 48° F. either at Lanesboro or in the country a hundred and fifty miles to the southward.

It thus appears that each species has a wide range of temperature at which it can migrate. In the case of early migrants this varies from 40° F. down to many degrees below freezing, while with the latest from about 40° F. to 70° F.

If the movements of migration are caused by the weather, then it should be that a late spring would retard the arrival, and that the birds would appear earlier in an unusually warm season. The facts do not seem to bear out this supposition. During the nine years, 1885-1893, at Lanesboro, the larger variation in the time of arrival occurred under the following conditions. In this table a 'warm' temperature is three or more degrees above the normal and a 'cold' an equal amount below; the intervening temperatures are called 'normal.'

Bird arrivals at Lanesboro, Minn. 1885-1893.

	No. of Instances.
The birds came three or more days	
early with a warm temperature.....	58
late " " cold "	60
on time with normal temperature.....	7
Arrivals agree with theory.....	125

The birds came three or more days	
early with a cold temperature.....	42
late " " warm "	41
early " " normal "	29
late " " " "	23
Arrivals do not agree with theory.....	135

The above figures show that in the case of the more pronounced variations, the arrival seems to have been hastened by warm weather or delayed by cold in only 125 instances out of 260, or only 48 percent.

The smaller variations show still less dependence of movement on warmth.

Bird arrivals at Lanesboro, Minn., 1885-1893.

	No. of Instances.
The birds came one or two days	
early with a warm temperature.....	47
late with a cold temperature.....	38
Arrivals agree with theory.....	85
The birds came one or two days	
early with a cold temperature.....	28
late with a warm temperature.....	43
early with normal temperature.....	18
late with normal temperature.....	23
The birds came on time with a cold temperature.....	15
" " " " " " " " warm temperature.....	21
Arrivals do not agree with theory.....	148

Here is no evidence at all that the temperature has either stimulated or retarded bird migration.

A slight connection may be noted by comparing the total number of arrivals in warm and in cold weather. During the spring days of these nine years, when the temperature was above the normal, 243 arrivals of birds were noted, and when the temperature dropped below the normal, only 182 birds were recorded as arriving. This shows that whether or not the warm weather causes them to come earlier, they prefer on the average to advance when the weather is warmer than normal.

Birds prefer to migrate in spring during a rising temperature. This preference is strongly marked as will be seen by the following table based on the records of 1885-1893 at Lanesboro, Minnesota.

Year.	Number of instances that the mean temperature of the day of arrival was —		
	Three or more degrees warmer than that of the previous day.	Within two degrees or less of that of the previous day.	Three or more degrees colder than that of the previous day.
1885	20	10	18
1886	19	32	8
1887	37	6	11
1888	31	17	13
1889	28	13	17
1890	17	28	12
1891	41	14	5
1892	16	21	21
1893	25	19	10
Total	234	160	115

It will be noticed that the instances of arriving during or just after a rising temperature are just about twice as numerous as the opposite. Moreover it is to be remembered that out of these latter, there are 36 that occur on a pronounced cold day following just after a pronounced warm day, and it may easily be that many of these actually arrived on the warm wave of the day previous and were not detected until the following day.

The temperature of the day of arrival is on the average higher than the average temperature of the two days before the bird is noted. This is another way of saying that on the average birds move north when a rise of temperature occurs.

Species.	Average temperature of the day of arrival.	Average temperature of the two days previous to arrival.
	degrees F.	degrees F.
Lanesboro, Minnesota		
Robin	41	35
Fox Sparrow	46	42
Towhee	56	52
Brown Thrasher	57	56
Rose-breasted Grosbeak	59	56
Baltimore Oriole	58	55
Wilson Warbler	56	55
Magnolia Warbler	58	56
Scarlet Tanager	58	56
Grinnell, Iowa.		
Robin	35	28
Fox Sparrow	46	42
Towhee	49	43
Brown Thrasher	57	52
Rose-breasted Grosbeak	57	52
Oyenbird	55	51
Baltimore Oriole	55	53
Scarlet Tanager	56	55
Average	53	50

Let us next consider the very wide range of temperature under which birds migrate. The temperature at the time of the bird's arrival is easily ascertained, since it is probable that most night migrants begin their flight soon after nightfall, and accomplish the larger part of their journey before midnight, so that the temperature at ten o'clock in the evening would be close to the average temperature for that night's migration. This ten o'clock temperature can be calculated for any part of the Mississippi Valley from the permanent records of the United States Weather Bureau, and in the prosecution of this research, unlimited access was given by the Bureau to their original data.

To ascertain whether any relation exists between the arrival of the birds and temperature, eight common birds were selected, species so common, well known, and conspicuous, that they would

probably be seen immediately on arrival; these eight birds were also selected from early, medium, and late migrants, so as to have the test made during all parts of the migration period.

Species.	Average date of arrival.	10 p. m. temperature of the day before the bird was first seen.			
		Average.	Ex- tremes.	Extreme variati'ns.	Average variation.
		deg. F.	deg. F.	deg. F.	deg. F.
Lanesboro, Minnesota, 1885-1890.					
Robin	March 16	40	28-47	19	4
Fox Sparrow	April 4	44	33-58	25	7
Towhee	April 16	54	41-67	26	8
Brown Thrasher	April 24	57	38-69	31	10
Rose-breasted Grosbeak	May 4	59	36-67	31	8
Ovenbird	May 4	56	35-72	37	11
Baltimore Oriole	May 4	54	46-66	20	6
Scarlet Tanager	May 10	54	36-69	33	11
Average				28	8
Grinnell, Iowa, 1885-1890.					
Robin	March 6	32	24-41	17	5
Fox Sparrow	March 26	46	33-51	18	8
Towhee	March 21	46	34-51	17	5
Brown Thrasher	April 15	55	44-71	27	7
Rose-breasted Grosbeak	April 29	60	48-74	26	8
Ovenbird	April 29	55	48-67	19	5
Baltimore Oriole	April 29	56	49-71	22	5
Scarlet Tanager	May 2	60	52-71	19	7
Average				21	6
Average of both localities				24	7

The average variation in the time of arrival of these eight species is 3.8 days and the average variation in the temperature is 7° F. During the months of March, April, and May, the temperature in the Mississippi Valley rises about one degree for each two days, so that a variation of 7° F. would be equivalent to about fourteen days

variation in the time of migration. Thus the temperature under which the birds are migrating is about four times as variable as the day of arrival of the birds.

The above table representing the temperature at 10 P. M. of the night during which the birds arrived is probably the nearest approximation that can be obtained to the actual temperature at the time the birds arrived. Since the birds have undoubtedly flown many miles during the night, it might be that the temperature of the place where the evening flight started would have a controlling influence.

Species.	Average date of arrival at Lanesboro.	10 P. M. temperature, 150 miles south of Lanesboro, on the evening before the bird was first seen at Lanesboro.			
		Average.	Ex- tremes.	Extreme variati ^o ns.	Average variation.
		deg. F.	deg. F.	deg. F.	deg. F.
Robin	March 16	45	34-57	23	7
Fox Sparrow	April 4	49	40-57	17	6
Towhee	April 16	58	47-73	26	9
Brown Thrasher	April 24	59	39-66	27	7
Rose-breasted Grosbeak	May 4	61	40-70	30	7
Ovenbird	May 4	58	40-71	31	10
Baltimore Oriole	May 4	57	49-64	15	4
Scarlet Tanager	May 10	58	40-76	36	7
Average				26	7

The average of these last two tables is probably the best statement obtainable of the actual temperature at which the birds migrated.

It is difficult to see how the mean temperature of the day when the bird was first noted could have had any great influence on its migratory movements of the previous night, but as these conditions under which we first see the bird are the ones we are most likely to associate with the bird's arrival, they have also been calculated.

Species.	Average date of arrival.	Mean temperature of the day the bird was first seen.			
		Average.	Ex-tremes.	Extreme variation.	Average variation.
Lanesboro, Minnesota, 1885-1890.		deg. F.	deg. F.	deg. F.	deg. F.
Robin	March 16	41	31-52	21	7
Fox Sparrow	April 4	46	38-52	14	4
Towhee	April 16	56	38-66	18	8
Brown Thrasher	April 24	57	45-67	22	8
Rose-breasted Grosbeak	May 4	59	36-73	37	10
Ovenbird	May 4	55	36-73	37	10
Baltimore Oriole	May 4	58	44-73	29	9
Scarlet Tanager	May 10	58	36-69	33	9
Grinnell, Iowa. 1885-1890.				25	8
Robin	March 6	35	12-24	32	4
Fox Sparrow	March 26	46	38-56	18	6
Towhee	March 21	49	38-58	20	6
Brown Thrasher	April 15	57	45-67	22	6
Rose-breasted Grosbeak	April 29	57	49-71	22	6
Ovenbird	April 29	55	47-62	15	4
Baltimore Oriole	April 29	55	49-70	21	6
Scarlet Tanager	May 2	56	47-71	24	8
Average				22	6
Average of both localities				24	7

Other temperatures were also compared as follows:

Temperature.	Extreme variation.	Average variation.
	deg. F.	deg. F.
Mean temperature of the day before the bird was first seen	19	5
Average mean temperature of the two days before the bird was seen	15	5
Average mean temperature of the second and third days before the bird was seen	16	5
Mean temperature, 150 miles south of the place of observation, of the day before the bird was seen	21	6

The above temperatures probably include all that would influence the bird in the flight which brought it to the place of observation. A careful examination of these tables will convince anyone that these temperatures with their great variations could not have been the cause of the migration. A bird that arrives with an average temperature of 50° F. may appear one year when the temperature is below 40° and is just as likely to be seen for the first time the next year with a temperature far above 60°. Even omitting the extreme variations, yet the average variations are far more variable than the movements of the birds and demonstrate that temperature alone does not cause the birds to move northward.

Conversely these figures show that no one of these birds is restricted to any single temperature for the performing of its migration, but that each one can and does migrate with a wide range of temperature.

It is interesting to note in passing, the wide differences between the average temperature of the day of arrival, and the average of the temperatures of the days of arrival. Thus the average date of arrival of the Robin for the years 1885-1890 was at Lanesboro, Minn., March 16, and the average temperature of March 16 at Lanesboro is 31° F. But the average of the temperatures of the days during 1885-1890 on which the Robin was first seen at Lanesboro was 41° F. This indicates that the Robin had varied its arrival both before and after March 16 so as to arrive on those days that were warmer than the average. An extreme difference of 10° was found in the case of the Robin which is an early migrant and often encounters severe storms. With birds like the Brown Thrasher which move about the middle of the season these differences are only about half as great, while in the case of late migrants like the Baltimore Oriole and the Scarlet Tanager these differences disappear, since in the latter part of the season few storms are severe enough to interfere seriously with migration.

In addition to all the local temperatures at the time of arrival, it is possible that the total heat for the previous month or the total heat of the whole spring might be a determining factor. All of these different temperatures were examined and to show how they work out in detail, all these temperatures are given for a single species; the bird selected is the Baltimore Oriole because that

Relation between the Weather and the Arrival of the Baltimore Oriole at Lanesboro, Minnesota.

Year	1884	1885	1886	1887	1888	1889	1890	1891	1892	1893	May 4	Average Percent of Variation
Date of arrival	May 6	May 6	May 5	May 1	May 6	May 5	May 2	May 3	May 3	May 6	May 4	
Total degree of heat from January 1 to day of arrival	3507	3132	3833	3332	2940	3904	3576	3716	3594	3037	3427	31
Total degree of heat from March 1 to day of arrival	2644	2548	2814	2513	2283	3060	2377	2455	2432	2459	2562	30
Total heat at Dubuque from March 1 to day before arrival at Lanesboro	2707	2698	2721	2522	2528	2944	2417	2507	2457	2564	2597	20
Total heat at Davenport from March 1 to day before arrival at Lanesboro	2901	2805	2815	2614	2686	3014	2570	2565	2588	2661	2615	15
Average temperature of April at Lanesboro	46	46	52	48	44	49	50	49	44	43	47	19
Average temperature of April at Dubuque	48	47	51	51	48	50	51	51	46	45	49	12
Average temperature of April at Davenport	50	49	52	52	50	51	53	52	47	47	50	12
Mean temperature at Lanesboro of the day the species was first noted	57	53	59	73	50	68	54	50	46	50	56	48
Mean temperature at Lanesboro of the day before arrival	58	51	57	67	51	58	48	51	51	48	54	35
10 p. m. temperature at Lanesboro of the day before arrival		46	56	65	52	66	54				56	36
Mean temperature at Dubuque of the day before the bird is noted at Lanesboro	61	55	59	66	54	59	50	51	58	44	56	40
Mean temperature at Davenport of the day before the bird is noted at Lanesboro	63	56	60	65	56	60	50	50	62	44	57	37
10 p. m. temperature at Davenport of the day before the bird is noted at Lanesboro		49	56	64	59	67	59				59	31

has the smallest variation in its time of arrival of all the birds that were recorded at Lanesboro.

In the matter of the total amount of heat received in the spring the variations are 30 percent whether estimated from the first of January or from the first of March, moreover the largest variations from 2283° in 1888 to 3060° in 1889 occur with but a single day difference in date of arrival. The same result is obtained if the date of appearance is compared with the total heat received in the vicinity of Dubuque, eighty miles south of Lanesboro, or at Davenport, a hundred and fifty miles farther south, though the percentage variations are not so great, that at Davenport being only 15 percent.

Parenthetically it may be remarked that the temperatures during the winter and previous to March 1 have seemingly no effect on plant or animal growth and it is the degrees of heat after March 1 that determine the advance of the season. This was strikingly shown at Washington, D. C., the spring of 1912, when after a winter of unusual severity in January and February, the growth of plants became fully up to normal as soon as the heat after March 1 had risen to its normal and long before the total heat counted from January 1 had reached the average. The bird arrivals averaged earlier than usual notwithstanding the cold winter.

The variations in the time of the arrival of the bird from year to year do not agree with the variation of the season. The spring of 1889 is the warmest, March and April together, at all three places; indeed that spring is one of the warmest the Mississippi Valley has ever known, but the Oriole does not arrive so early this year as the average of the ten years. But little relation can be traced between the changes in temperatures and the changes from year to year in the time of arrival. It is true that in 1893, when the Oriole arrived at its latest date — May 6 — the temperature is the coldest at all three places, and in 1887 when the date of arrival is the earliest — May 1 — the temperature is also the highest at all three places. But here the agreement ends, for the Oriole also arrives on May 6 in the years 1884, 1885, and 1888, that are both cold and warm years and on May 2 in 1890 that is among the colder years.

During spring migration the direction of the wind seems to have

little if any effect on the arrival of the birds. There were 253 days when arrivals were noted at Lanesboro, Minn., 1885-1893, and the wind the night before had been from the following directions: west, 29 times, northwest 45, north 29, northeast 22, east 18, southeast 27, south 51, southwest 24, calm 8 times. Combining the directions, the sum of the northwest, north, and northeast winds is 96 times and the sum of the southeast, south, and southwest, 102 times. Thus the birds migrated with the wind blowing against them just about as frequently as with a favorable wind. It is especially to be noted that the percentage of each of the winds in the above table is very close to the average percentage of the time in the spring that the wind is in that direction. Thus the birds arrived with a south wind, 51 times or 20 percent of the times observed. During the 828 days of March, April, and May, 1885-1893, the wind was south 161 days or the same 20 percent. The birds arrived with a northwest wind 18 percent of the times and the wind blew from the northwest 19 percent of the time.

Direction of the wind.	Percent of days the wind blew from this direction.	Percent of times the birds arrived with a wind from this direction.
West	13	11
Northwest	19	18
North	13	11
Northeast	9	9
East	5	7
Southeast	10	11
South	20	20
Southwest	8	10
Calm	3	3

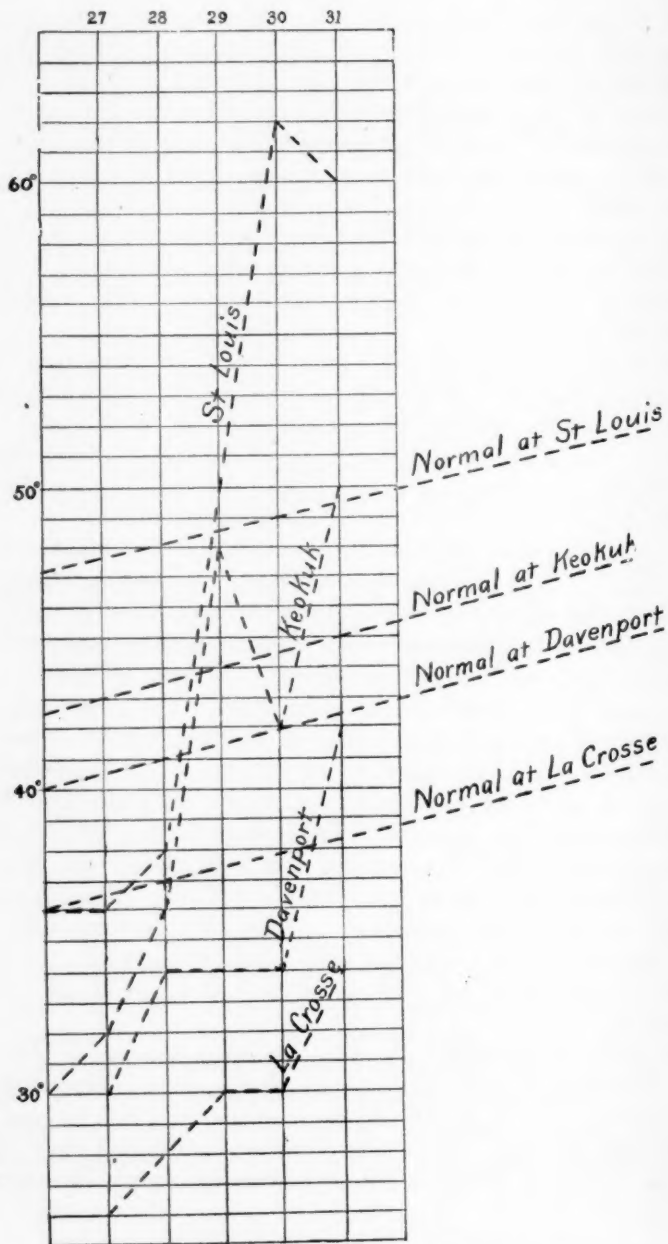
These figures show that when birds are moving north in the spring they pay little attention to the direction of the wind. The same conclusion was reached after an extended investigation of the date of migration as observed at the lighthouses of southern Florida. The Biological Survey has the records for many years of each night in spring on which birds were noted passing the lights. These birds are fresh arrivals in Florida after a flight over the ocean

from Cuba. One would expect these birds, if any, to wait for a favoring wind before starting to sea, but the records indicate that they pay no attention to the direction of the wind. If the birds preferred a south wind, there should be a large number of arrivals during south wind periods, or if they disliked a head wind, there should be only a few north wind records. As a fact neither of these conditions is found and the percentage of migration with a south wind is no greater than the average percentage of south wind that occurs there during the spring months, and the birds fly directly against a north wind as often proportionally as north winds occur.

Spring migration consists of a series of rapid advances followed by days of inactivity or possibly of retrogression. After a check to the northward movement and a period of rest, when the next advance occurs, it does not merely proceed far enough to make up for the lost time, but the birds are quite apt to make a long flight forward until they are in advance of their normal position.

A striking example occurs in the migration notes from Lanesboro, Minnesota. During the spring of 1888, the temperature dropped on March 22, thirty-four degrees below the normal and migration was suspended for about two weeks. The temperature rose gradually and when the warmth was almost to normal on April 1, a great arrival of birds occurred. The Phoebe, Bronzed Grackle and Killdeer appeared after a delay of five, four, and three days respectively; the Song Sparrow was present just on time, while the Fox Sparrow was three days in advance of his usual date, the Brown Creeper four days, the Ruby-crowned Kinglet, Yellow-bellied Sapsucker, Field Sparrow and Purple Martin, seven, nine, nine, and ten days earlier than usual. This early arrival is the more strange in this particular case, because the temperature, while it rose decidedly, did not quite reach normal, so that these last six species flew far north at an early day and during cold weather.

It seems probable that in such cases some abnormally warm weather to the south of the place of arrival is the real cause of the phenomenon, but in the present instance one must look far south for the warm wave. The course of the weather during the three days previous is shown in the accompanying chart. Lanesboro



TEMPERATURE AT 10 P.M., MARCH 27-31, 1888.

is so near LaCrosse that the temperatures of the two places were probably not much different. The evening of March 28, the temperature is lower than normal throughout the Mississippi Valley. During the next day the temperature at both Keokuk and St. Louis rises above the normal bringing on a large migration at St. Louis with clear weather and a south wind all the way from St. Louis to the Gulf.

The night of March 31 is clear over all the Mississippi Valley from St. Paul to the Gulf, with a light south wind from the Gulf to Cairo, and a light east and northeast wind the rest of the way to LaCrosse. The temperature at St. Louis is far above normal, Keokuk, a little above, Davenport slightly below and LaCrosse about five degrees below normal. Conditions for migration were therefore very favorable from the south to about Keokuk and thence northward not unfavorable. Hence it may be considered that these six species — the Fox Sparrow, Brown Creeper, Ruby-crowned Kinglet, Yellow-bellied Sapsucker, Field Sparrow and Purple Martin — had arrived by the night of March 29 in southern Iowa (judging from the weather and from the notes contributed by the observers in Iowa) and during the evening of March 31 they started north again. The individuals that were noted at Lanesboro the morning of April 1 had therefore traveled the night before from at least as far south as Davenport and probably from Keokuk.

TWO NEW RACES OF THE PIGMY OWL FROM THE
PACIFIC COAST.

BY J. GRINNELL.

(Contribution from the Museum of Vertebrate Zoölogy of the
University of California.)

STUDENTS of Californian birds have long been aware of the existence within this state of two readily distinguishable races of the Pigmy Owl. One inhabits the humid coast belt south to Monterey County, the other occupies the relatively much more arid Sierra Nevada, and mountain ranges of southern California. The first-indicated subspecies has borne the name *Glaucidium gnoma californicum*; the second, having been assumed to be the same as the Rocky Mountain bird, was called, in common with the latter, *Glaucidium gnoma gnoma*.

Beyond a haunting suspicion that the Californian interior bird might prove different, upon comparison of actual specimens, from that of the Rocky Mountain region, the situation remained unchanged until, in 1910, E. W. Nelson (Proc. Biol. Soc. Wash., Vol. XXIII, p. 103) named the Rocky Mountain Pigmy Owl as distinct from the true *G. g. gnoma* at the southern end of the Mexican Tableland. The northern bird received the name *Glaucidium gnoma pinicola*. In Nelson's description of it comparison is made with not only true *gnoma* but also with *californicum*, the latter name being clearly used for the small, reddish-brown humid coast race.

These comparative remarks at once aroused a query as to the relationships of the Californian interior bird; and the writer forwarded to Mr. Nelson two southern California specimens for critical examination. These he pronounced to be *not* his *G. g. pinicola*, but probably representative of a distinct new subspecies. Since the only question in the writer's mind was in regard to the distinctness between the Californian interior race and Nelson's *pinicola* of the Rocky Mountains, the course of action seemed to be perfectly clear, that is, to formally name the southern California

bird. It would have been more proper for Mr. Nelson himself to have described the race, in view of his work in the genus; but claiming to be engrossed with work upon newly arrived Central American material, he courteously insisted upon the writer's assuming the not distasteful function of describer.

In order that comparisons in both directions might be verified, seven examples of *G. g. pinicola* from the Biological Survey collection were, through the kindness of Mr. H. W. Henshaw, forwarded to the writer as a loan. These, together with the west coast material in the California Museum of Vertebrate Zoölogy and in the private collections of F. S. Daggett, H. S. Swarth and J. Grinnell, form the basis for the following characterizations.

The assembling of this material unexpectedly pointed to the expediency of further nomenclatural action. Mr. H. S. Swarth has already pointed out (Univ. Calif. Publ. Zool., Vol. 10, 1912, pp. 31, 32) the peculiarity in coloration of four Pigmy Owls from Vancouver Island. There now seem to be sufficient grounds for recognizing an extreme northern humid coast race, the range of which is to be split off from that previously accorded to *G. g. californicum*. The latter name is thus restricted to the subspecies inhabiting the coast belt from Washington to central California.

Close study has resulted in the conclusion that there is a dependably constant tone of coloration in Pigmy Owls from any one faunal area, in other words that much of the variation which strikes one at first glance as being extraordinary, is accounted for by difference in wear and age. Only adults have the top of head uniform in shade with the dorsum, juvenals, even though full-grown and full-feathered, having the top of the head slate gray of varying shades conspicuously contrasted with the brownish of the back. The writer is unable to find any so-called "phases" of coloration in this species.

The designation of *three* forms of *Glaucidium* from the Pacific Coast district may seem a surprising innovation to some, but it is nothing more than might be expected after a review of the facts as already worked out in other genera of resident birds. The reader should recall the present systematic treatment throughout the same area, of *Bubo*, *Otus*, *Dryobates*, *Cyanocitta*, *Certhia*, and *Thryomanes*.

***Glaucidium gnoma vigilante*, new subspecies.**

SIERRA PIGMY OWL.

TYPE.—♀ ad., no. 379, coll. J. Grinnell; foothills at 2250 ft. alt., 4 miles north of Pasadena, Los Angeles County, California; February 18, 1894; collected by J. Grinnell.

DIAGNOSIS.—Nearest like *Glaucidium g. californicum*, but size slightly larger and coloration much paler, broccoli brown dorsally and laterally, instead of warm russet brown; light markings slightly more increased in extent. Differs from *G. g. pinicola* in smaller size, and distinctly browner coloration; white flecks on back circular in shape rather than of transverse trend.

DISTRIBUTION.—Mountain ranges of southern California, and southern Sierra Nevada, at least from Bear Valley, San Bernardino County, north to Lindsay, Tulare County (probably throughout the Sierra Nevada north to Mount Shasta).

***Glaucidium gnoma swarthi*, new subspecies.**

VANCOUVER PIGMY OWL.

TYPE.—♀ ad., no. 15637, Calif. Mus. Vert. Zool.; Errington, Vancouver Island, British Columbia; September 11, 1910; collected by H. S. Swarth.

DIAGNOSIS.—Nearest like *Glaucidium g. californicum*, but much darker colored throughout, inclining to bistre dorsally, and white markings much reduced in extent; feet and legs heavily suffused with sepia; streaking below nearly black; size as in *californicum*. Differs from *G. g. pinicola* in smaller size, very much darker and browner coloration, and restriction of light markings; the remnants of the latter are pervaded with deep clay color.

DISTRIBUTION.—Vancouver Island (and, probably, adjacent mainland of British Columbia and coast belt of Washington).

REMARKS.—The name selected for the subspecific appellation of this new race serves as a merited means of signaling the painstaking field and systematic research devoted to northwest coast ornithology by Mr. Harry S. Swarth during his incumbency as Curator of Birds in the California Museum of Vertebrate Zoology.

MEASUREMENTS.

G. gnoma pinicola, ♀, no. 203634, U. S. Nat. Mus., Jamez Mts., New Mexico: Wing 105 mm., tail 79, tarsus 23.

G. gnoma vigilante, ♀, type: Wing 96.4, tail 73, tarsus 20.8.

G. gnoma californicum, ♀, no. 4396, Calif. Mus. Vert. Zool., Marin County, California: Wing 93.4, tail 65, tarsus 20.7.

G. gnoma swarthi, ♀, type. Wing 92.3, tail 67.7, tarsus 20.

ONTARIO BIRD NOTES.

BY J. H. FLEMING.

SINCE my 'Birds of Toronto' was published in 'The Auk'¹ the manuscript list of Toronto birds written about 1885 by Mr. Ernest Seton has been found in the records of the Biological Survey at Washington, and though the annotations are as brief as possible, it is of considerable value. A greater part of the portion dealing with the water birds is based on information supplied by the late Wm. Loan, a professional shooter whose information is known to have been reliable. The list supplies definite records for two species that were in my hypothetical list.

Since 1906 several species have been found breeding at Toronto that were not known to do so then, and additional records of several rare birds are given in this article, together with other unpublished Ontario records.

***Sula bassana*.** GANNET.—An immature male freshly killed was found floating in Lake Ontario outside Toronto on December 19, 1908; it was in good condition and had recently swallowed a herring seven inches long; the bird is now in my collection.

Another immature bird taken near Ottawa on October 14, 1909, has been recorded by Mr. J. M. Macoun,² and I am informed by Mr. E. G. White that a second specimen was taken at Ottawa about the same time and mounted by Mr. Henry.

***Hydrochelidon nigra surinamensis*.** BLACK TERN.—No breeding records for Toronto till 1906 when Mr. W. R. Humphreys took a set of two eggs on May 30 in Asbridge's Marsh. This tern has since become a not uncommon breeder; a pair seen at Toronto Island on July 18, 1911, had downy young, and were not themselves in full plumage, both having a good deal of white on the head and under parts.

***Pelecanus erythrorhynchos*.** WHITE PELICAN.—The only definite Toronto record is from Seton's manuscript list as follows: "Wm. Loan killed one in 1862, has seen at least a dozen in all."

***Marila collaris*.** RING-NECKED DUCK.—A female taken on September 24, 1906, by Mr. O. B. Spanner at Wassy Lake, Coleman Township, Parry Sound District, is in my collection. Ring-necked Ducks are not

¹ Auk, 1906, pp. 437-453, 1907, pp. 71-89.

² Ottawa Naturalist, 1910, p. 192.

common in southern Ontario and the following records are of interest: in 1906, I examined three females (?) that were taken about October 15, and five full plumaged males that were taken about November 6, the exact locality could not be ascertained except that they were from southern Ontario and probably at no great distance from Toronto. In 1907, I examined two that had been taken probably at Toronto Island on October 12, and saw two more on the 22d, from somewhere in southern Ontario. On April 9, 1909, I saw a single pair in a large flock of mixed ducks that were sheltering in Toronto Bay from a westerly gale. The rarity of this species is interesting when compared with Mr. Loan's statement in Seton's manuscript list as follows: "Marsh Bluebill, uncommon migrant, first week of April to last of September, years ago it was our commonest duck."

Chen hyperboreus hyperboreus. SNOW GOOSE.—In Seton's manuscript list the following Toronto record is given based on Mr. Loan's information. "Very rare fall migrant, four killed in 1875, several seen since."

Olor columbianus. WHISTLING SWAN.—A flock of six were in Toronto Bay, from April 8 to 18, 1909. They were seen by a number of observers and were identified by Mr. J. H. Ames on the 18th. The birds were driven in by a heavy westerly gale.

Mycteria americana. WOOD IBIS.—One taken in November, 1892, near Simcoe, Norfolk County, by a farmer, name unknown. The record is based on a drawing of the dead bird made by a correspondent of Mr. C. W. Nash, to whom I am indebted for permission to publish this first Ontario record.

Rallus elegans. KING RAIL.—A male taken at Toronto on April 24, 1907, is in my collection.

Gallinago delicata. WILSON'S SNIFE.—A nest containing four eggs was found in Ashbridge's Marsh on May 12, 1910, by Mr. R. Buchanan; the eggs were undisturbed and later the young were photographed by Mr. J. A. Munro. This is the first definite Toronto breeding record.

Limosa fedoa. MARBLED GODWIT.—An adult female taken on the Eastern Sandbar, Toronto, on September 20, 1906, is the first Autumn record. An immature bird taken at the same place on August 13, 1909, is the first young bird recorded from Toronto.

Charadrius dominicus dominicus. GOLDEN PLOVER.—The following records show that this Plover is again increasing on Toronto Island: 1906, September 3, one shot by Mr. H. H. Mitchell, September 8, two seen by Mr. Mitchell; 1907, September 30, three taken; October 2, one taken, October 12, several taken; 1909, September 20, one seen; 1910, September 26, a number taken (I examined twelve, one of which was an adult), October 21, one taken, the latest record. All were young birds except the one noted.

Aegialitis meloda. PIPING PLOVER.—Though breeding at Point Pelee and other places on Lake Erie and possibly in Prince Edward County

on Lake Ontario, the Piping Plover has never been more than a migrant at Toronto till 1907, when Mr. W. R. Humphreys found two young and two eggs on the Eastern Sandbar on June 23. In 1908, a number of pairs bred along the whole lake front of Toronto Island, — a set of three eggs was found on July 1, and a downy young was taken by a boy on the same date, and another downy young was seen on June 10. I saw three pairs of old birds on July 6.

Cathartes aura septentrionalis. TURKEY VULTURE.— A young male taken at Scarboro near Toronto, November 17, 1908, was mounted by Mr. O. Spanner. Another unpublished Ontario record is copied from the journals of the late J. Hughes Samuel, December 2, 1895, Peterboro: Ontario: "Called on Elcombe the local taxidermist, he has a fine specimen of Turkey Buzzard taken on the banks of Indian river at Warsaw, 14 miles from Peterboro during the summer by a man named Spencer, the hotel keeper Morgan of Warsaw tells me that Spencer winged this bird and kept it alive for several weeks."

Astur atricapillus atricapillus. GOSHAWK.— A large flight occurred in 1906, from October 13 to November 26. I examined over a dozen from Toronto and heard of as many more that had been taken, all full plumaged birds. The flight extended east to Ottawa and a few remained about Toronto during the winter. I received one from Oakville, 19 miles west of Toronto, on January 4, 1907.

Buteo borealis krideri. KRIDER'S HAWK.— An immature bird taken at Pickering, 23 miles east of Toronto, on August 19, 1901, by Mr. W. B. Rubidge, is in my collection; this is the first Ontario record.

Buteo swainsoni. SWAINSON'S HAWK.— One taken at Toronto on October 16, 1909, an immature bird in the dark phase with yellowish markings, mounted by Mr. O. Spanner.

Scotiaptex nebulosa nebulosa. GREAT GRAY OWL.— A flight appears to have passed eastward along Lake Ontario in 1907. On January 3, I received one from Port Credit, 13 miles west of Toronto, on January 4, one from Mimico, 7 miles west, and on February 1, one from Toronto and on March 8, one from Trenton, 100 miles east of the city. Besides these I heard of a number of others that were taken. I examined two taken at Toronto, February 11 and 15, 1911.

Cryptoglaux funerea richardsoni. RICHARDSON'S OWL.— A male picked up dead but quite fresh at Toronto on June 11, 1907; the bones of both legs were crushed and gangrenous, and death was due to starvation. The bird had probably been trapped and released as it showed no traces of captivity. A female taken at Toronto January 13, 1910, is in my collection, as is the June bird.

Bubo virginianus subarcticus. ARCTIC HORNED OWL.— I examined a female of this form of Horned Owl taken together with two small downy young about April 24, 1911, at Heaslip, 123 miles north of North Bay. This breeding record explains the presence in winter of this Owl in southern Ontario.

Nyctea nyctea. SNOWY OWL. The majority of Snowy Owls that migrate into southern Ontario in winter are birds of the year, but in 1906, a flight of adults, males as far as I examined them, appeared on October 13. A very white one was taken at Toronto, on November 1, three more males were taken, two of them almost spotless, the other very white. I examined between November 19 and 26, several more exceptionally white birds from the city and three from Bradford, 40 miles north of Toronto, these were also very white birds.

Otocoris alpestris hoyti. HOYT'S HORNED LARK.—One male taken at Port Sydney, Muskoka, May 17, 1909, by Mr. Alfred Kay in whose collection the bird now is. This is probably a non-breeding bird, and was shot, together with one Horned Lark and one Prairie Horned Lark, from a small flock that had been for some time about Mr. Kay's yard.

Hesperiphona vespertina vespertina. EVENING GROSBEEK.—Small flocks visited Toronto in March, 1907, and February, 1909, and from November 23, 1910 to January 29, 1911, flocks were in and about the city. I counted twenty, many of them old males, in one mountain ash.

Calcarius pictus. SMITH'S LONGSPUR.—An immature female taken by Mr. Geo. E. Atkinson, at Port Arthur, Ontario, in September, 1892, is in my collection and is the first Ontario record. It is due to Mr. Allan Brooks' keenness that the bird was recognized in my collection, and I have since checked the identity with the aid of Dr. J. Dwight, Jr., and Dr. Louis B. Bishop, as the stage of plumage is a little known one.

Progne subis subis. PURPLE MARTIN.—There has been a noticeable increase in the number of Martins about Toronto since 1906. In 1909 one pair returned to the old nesting box in my garden that had been abandoned for several years, and bred, and in 1912, seven pairs brought off broods in the same box.

MORE NOTES ON THE MORNING AWAKENING.¹

BY FRANCIS H. ALLEN.

MR. WRIGHT's paper on 'Morning Awakening and Even-Song' ('The Auk,' July, 1912, XXIX, p. 307) has interested me not a little, and the more so that for many years I have been making occasional observations along that very line. My notes, which began in June, 1883, were made chiefly at different places within thirty miles of Boston, but I have also the record of a single morning near Mt. Katahdin in Maine. They are more fragmentary than Mr. Wright's because they often include only a few of the very earliest singers. For some birds I have more records than Mr. Wright, while for others I have much fewer and for still others which occur on his list I have none at all. My excuse for presenting a few of my own notes after his very careful and thorough records have been published is that, for one thing, they were made in different localities from his and therefore give different results in some particulars, and for another, my deductions from the evidence are at times somewhat at variance with his.

I must explain that my observations were made on various dates during these last thirty years, ranging from May 29th to July 26th, and that before computing my averages I have in every case reduced the time to terms of the summer solstice, subtracting from each record the number of minutes by which the sun rose on that date later than the time of earliest sunrise. Thus on July 26, 1906, at Weston, Mass., the Robins began singing at 3.36, but the sun on July 26 does not rise till 24 minutes later than at the solstice; I therefore deduct the 24 minutes and set the Robin's beginning at 3.12. It may also be worth while to say that the time used in this paper, as in Mr. Wright's, is Standard Time, which at Boston is 16 minutes behind the local time. To get the actual local time, therefore, for purposes of comparison with other places, 16 minutes should be added to each of these averages. The local time at Jefferson, N. H., is about 14 minutes ahead of the Standard,

¹ Read before the Nuttall Ornithological Club, October 7, 1912.

so that that amount should be added to Mr. Wright's figures to reduce them to the local time. The time of earliest sunrise is 4.07 (Standard) at Boston, and, as Mr. Wright states, 4.02 at Jefferson, where his observations were made.

In the first place I find it necessary to differ with Mr. Wright as to the order of the first three species on his list, or rather as to the high rank he accords the first two, the Song Sparrow (*Melospiza melodia melodia*) and the Chipping Sparrow (*Spizella passerina passerina*), which, so far as my observations show, belong farther down. He places these two sparrows before the Robin (*Planesticus migratorius migratorius*) on the ground that though "the lusty character of the Robin's song from the time of its beginning throughout its first forty-five minutes' period of singing constitutes it the conspicuous early singer and makes it appear to be the earliest singer of all," yet "the Song Sparrow and the Chipping Sparrow both precede the Robin in a few earlier expressions of song." Mr. Wright admits that both these species occasionally awake and sing in the night, but he says that this early morning singing — this ante-Robin singing — is differentiated from the casual night singing by the fact that a second, third, and perhaps fourth bird follows the first singer. This reasoning does not seem to me conclusive, because, for one thing, I am pretty sure I have heard the same thing happen in the middle of the night, and moreover it seems natural to infer that if a considerable period of silence ensues after a first song, then the bird has dropped off to sleep again and has not experienced his actual 'morning awakening.' It may be pertinent to call attention to the fact that Mr. Wright's earliest time of beginning to listen was 2.35 and his earliest Song Sparrow 2.40 and Chipping Sparrow 2.45. If he had himself got out a quarter of an hour earlier, might he not have heard the two sparrows correspondingly earlier also? I also suspect that Mr. Wright's Jefferson Song Sparrows and Chippies may be somewhat exceptionally wakeful birds. My own notes record not a single day when the Chippy began before the Robin and only one occasion when the Song Sparrow preceded the Robin and at the same time came near enough to get into the list at all. That was on June 11, 1885, at West Roxbury, Mass., when the Song Sparrow was heard at 2.55

and the Robin not till 3.05. The Chipping Sparrow that morning did not begin till 3.20, and I am now pretty confident that this early effort of the Song Sparrow's should have been set down as a night song. My average of eighteen records of the Robin, makes his first song at 3.04. Mr. Wright's average of twelve is 3.02, approximately the same, though it should be remembered that the earliest sunrising at Jefferson, N. H., is five minutes earlier than at Boston. My average, therefore, is actually three minutes earlier than his, but the difference is so slight that I think the two may be considered identical. This makes the contrast in our averages for the two sparrows in question the more remarkable. My average of twelve records for the Song Sparrow is 3.17 as against Mr. Wright's 2.56 for the same number; and for the Chipping Sparrow my thirteen observations average 3.21, while his twelve average 2.58.

Mr. Wright notes the hurried manner of the Chipping Sparrow's singing after he gets warmed up to it in the morning. This habit is a striking one, and I do not remember to have seen it mentioned in print before. The trills at that time are much shorter than at other times of the day and follow one another in quick succession with hardly a breath between.

If we assume that my averages of the Song Sparrow's and Chipping Sparrow's beginnings are correct and that the former starts thirteen and the latter seventeen minutes after the Robin, then these two species should appear after the Veery in Mr. Wright's list, as numbers 11 and 12. There are, however, two other species which I am sure Mr. Wright would have accorded earlier places if he had had better opportunities to hear them. One of these, the Kingbird (*Tyrannus tyrannus*), he himself suspects. His two observations, coming at 3.22 and 3.24 respectively, seemed to point to 3.23 as a safe assumption for an average, but he admits that "it is not improbable that if other records had been obtained, the Kingbird might rank somewhat earlier in the list." With me the Kingbird ranks next after the Robin. My average of ten records when I have had one in the near neighborhood places it at 3.10. I cannot tell from my own observations just how it would rank in relation to the Alder Flycatcher, the Barn Swallow, the White-throated Sparrow, the Wood Pewee, and the Vesper Sparrow, be-

cause my records of these birds are too scanty, but reckoned as six minutes after the Robin it would follow the Vesper Sparrow on Mr. Wright's list. On one occasion during the present year I heard the Wood Pewee before the Kingbird and not long after the Robin's beginning.

It may be worth while to call attention to this early-morning song of the Kingbird, for it is a true song but seems to have escaped the notice of most bird-biographers. Though heard occasionally at all times of the day, it is characteristic only of the early morning. It resembles the flight song but is usually given, I am confident, from a perch. At any rate I have often seen the bird singing while perched, and the regular early-morning performance sounds like a stationary one. It is a prolonged, ecstatic, unmusical utterance which introduces a phrase suggestive of the word *phæbe* at frequent intervals among the chattering. I observed a Kingbird in song at 6 P. M., July 16, 1911, at West Roxbury, Mass., and made the following notes on the performance: "He was perched in the top of a tall elm. The song may be written as follows: *De-de-de-dzip'-de-de-de-dzee-dzee'-it*. The *de-de-de-de* part is delivered in a stuttering fashion. Sometimes the stutter and *dzip* are given twice before the other part, or climax [the *phæbe* part] of the song is given. The song is repeated over and over continuously for an indefinite period. With the *dzeeit* the tail is spread wide. Sometimes I thought the spreading of the tailed followed the *dzeeit* immediately instead of being simultaneous with it, but it was hard to be sure of that at the distance I was from the bird. The tail seemed to be spread *a little* all the time, but the spreading at the climax was abrupt and pronounced. The *dzip* note is somewhat emphatic but the *dzeeit* much more so."

The other bird that deserves an early place on the list is among those listed in a group after Mr. Wright's main list, as one that "apparently had not spent the night close by, but came within hearing in an adventitious way." This is the Tree Swallow (*Iridoprocne bicolor*), for which Mr. Wright has the single record of 4.40. As a matter of fact, the Tree Swallow is one of the very earliest singers in the morning concert. Indeed, I am not sure but he is the first of them all; for, of the three mornings when I have been favorably situated to hear the first of the Tree Swallow's singing,

on May 29, 1904, both that bird and the Robin were singing when I awoke at 2.53; on May 28, 1909, the Tree Swallow was heard at 3.25 and the Robin not till 3.30 (unusually late, probably because it was a cloudy morning with drizzling rain); and on June 4th of the same year the Tree Swallow was singing at 3.03 and the Robin was not heard till 3.07.¹ Other observers have noted this habit of early rising on the part of the Tree Swallow. Mr. Ralph Hoffmann, in 'A Guide to the Birds of New England and Eastern New York' states that "near a breeding-site the male may be heard singing before dawn, either from the box, or as he flies to and fro in the darkness." The birds I have heard singing thus have been flying. It is really a remarkable performance regarded as an exhibition of endurance. As I am not aware that it has been described in full, I venture to quote from my journal the notes made May 29, 1904, at Wrentham, Mass. The bird, as stated above, was heard singing when I awoke at 2.53.

He "sang continuously, apparently without interruption, from the time I first heard him till 3.40. The song came and went, as the Swallow flew about over the pond, now nearer, now farther away, now to the right, now to the left, but never stopping,— a constant *tsip-prrup*, *tsip-prrup-prrup*, *tsip-prrup*, *tsip-prrup-prrup-prrup*, *tsip-prrup-prrup*, *tsip-prrup-prrup-prrup-prrup*, varied only by the varying number of bubbling notes following each *tsip*. The ending of the performance seemed to come gradually. After a period when I heard no song from him,— he may have been singing somewhere out of my hearing, however,— I came upon him, or another of the same species, flying about over the land in full song at 3.56. The song was then kept up till 4.05, when I saw the bird perched high on an oak tree, still singing, but after that he allowed

¹ Dr. Charles W. Townsend, in 'Birds of Essex County, Massachusetts,' gives notes on the night singing and morning awakening of the birds on the freshwater marshes of the Ipswich River at Wenham, Mass., in which the singing of the Tree Swallow is recorded. This bird began on May 22, 1904, at 2.58, thirteen minutes after the first Robin song, which was heard at the very early hour of 2.45, the sun not rising on that date till 4.16. Another note, kindly furnished to me by Dr. Townsend, makes the Tree Swallow begin five minutes after the Robin at Ipswich, Mass., June 3, 1906. On June 1, 1906, at Newton Highlands, Mass., Dr. Townsend heard the Kingbird begin singing at 3.08, two minutes after the first Robin. Dr. Townsend, by the way, permits me to say that he agrees with me as to the preëminence of the Robin over the Song and Chipping Sparrows.

his voice short intervals of rest till 4.08, when he flew off and immediately started up the continuous performance again; and I left him still at it." When one considers that not only the voice but the wings are in constant use thus for over three quarters of an hour at a time, one can only marvel at the wonderful energy and endurance of the little bird.

Mr. Wright calls the Crow (*Corvus brachyrhynchos brachyrhynchos*) "a comparatively late riser" and gives the average time of his first call from fourteen records as 3.44. My average of thirteen records is 3.33, and I suspect that the wildness and comparative scarcity of the Crow in the White Mountain region, as contrasted with its abundance and familiarity in the country about Boston, may account for this difference.

With the exception of the Oven-bird, of which I have only four records, and the Redstart, Black-throated Blue, and Blackburnian, of which I have none, my Warbler observations indicate earlier rising than do Mr. Wright's. For the Maryland Yellow-throat (*Geothlypis trichas trichas*) my six records average 3.44 as against Mr. Wright's five at 3.51. For the Black and White Warbler (*Mniotilta varia*) I have two records averaging 4.03, while Mr. Wright's single one was at 4.04. Three records for the Black-throated Green Warbler (*Dendroica virens*) give an average of 3.38, as against Mr. Wright's average of 4.13 for the same number. For three other species I have only single records made at Hurd Pond, near Mt. Katahdin, Maine, June 27, 1897. These are rather surprisingly early. They are: Myrtle Warbler (*Dendroica coronata*), 3.03 (Mr. Wright's average of three is 4.25); Nashville Warbler (*Vermivora rubricapilla rubricapilla*), 3.04 (Mr. Wright's average of two is 3.53); and Magnolia Warbler (*Dendroica magnolia*), 3.09 (Mr. Wright's average of seven is 3.55). This morning at Hurd Pond was fine and calm; the light first showed in the east at 2.15, and the rays of the sun struck the farther shore of the pond at 3.58.¹ About 13 minutes should be added to the Hurd Pond

¹ It may be of interest to record the other awakenings noted at Hurd Pond on this date. In the order heard they were: Olive-backed Thrush (*Hylocichla ustulata swainsoni*), 2.52; White-throated Sparrow (*Zonotrichia albicollis*), 2.52; Herring Gull (*Larus argentatus*), calling, 2.57; Olive-sided Flycatcher (*Nuttallornis borealis*), calling, 3.05; Golden-crowned Kinglet (*Regulus satrapa satrapa*), 3.54.

figures for purposes of comparison with Mr. Wright's, in order to allow for the earlier sunrise at that latitude and longitude, than at Jefferson, N. H., just as five minutes should be subtracted from my records made in the neighborhood of Boston to allow for the later sunrise there.

Another early-rising warbler, which Mr. Wright has not recorded, is the Yellow Warbler (*Dendroica aestiva aestiva*). My average of five records is 3.24.¹ It will be seen that I cannot from my own experience endorse Mr. Wright's conclusions as to the late awakening habits of the Warblers as a family.

These remarks of mine are not to be taken as in criticism of Mr. Wright's admirable paper, which he clearly states to be the result only of his own records and individual experience in a single locality. They are intended, rather, to be supplementary to his records and conclusions, and they may serve to emphasize the fact that more observations from a number of different localities are needed in order to enable us to generalize with safety upon this subject of the Morning Awakening. For myself, I will simply say in recapitulation that, so far as my own observations show, the Song and Chipping Sparrows are much later risers than the Robin, the Kingbird is one of the very earliest of the early birds, the Tree Swallow is still earlier and may be the earliest of them all, the Crow is *not* a late riser, and neither are the Warblers as a family.

¹ Dr. Townsend has a record of 3.10 for June 13, 1908, at Ipswich, Mass., five minutes before the Song Sparrow and twelve minutes before the Chipping Sparrow.

NOTES ON SOME OF THE RARER BIRDS OF THE
PRAIRIE PART OF THE CHICAGO AREA.

BY G. EIFRIG.

DURING the three years of my residence in the small prairie town of Addison, Du Page County, Illinois, I have observed a number of birds that are rare nearly anywhere, or at least rare in this part of the state, some being first records for the county or even the so-called 'Chicago Area.' I had intended to send these observations as 'General Notes' to 'The Auk' from time to time, but lack of time prevented me, until now it seems best to put them together into one article.

Addison is situated about 20 miles west of Chicago, in undulating prairie, the highest point of which is about 350 feet above sea-level. The land is highly cultivated, except where imperfect drainage leaves spots too wet in spring. Here small remnants of the original prairie, with its interesting flora of shooting star, hawk-weed, wild onion etc., may be seen. There is a large piece of woodland, containing about two square miles, but otherwise there are no trees here, if we except the usually large cotton-woods found around most farm yards. Beside the above mentioned wet spots between fields, there are some sloughs, large and small, but usually not large enough to entice ducks or Black Terns to breed, while on the other hand the King Rail, Least Bittern, Long- and Short-billed Marsh Wrens and the inevitable Redwing find even the smallest of them to their liking. Salt Creek, which flows into the Desplaines River, is the only stream of the neighborhood, but, though rich in small fish, it harbors almost no Kingfishers along its course, at least here. In fact, the absence or rarity of certain species, which should be common, as the Chipping Sparrow, Whip-poorwill, Cedarbird, Least Flycatcher, Sparrow Hawk, Mourning Dove and others, is very puzzling.—Now to the notes proper.

While gulls are a very usual sight along the lake and river in Chicago, they are rare here in Du Page County. However, two Ring-billed Gulls (*Larus delawarensis*) alighted near the out-buildings in my garden on February 26, 1910. It had been

raining and storming, and there was much water standing on the ice and snow. At such times, and during high water in the spring, Herring Gulls (*Larus argentatus*) sometimes follow the course of the then rather formidable Salt Creek as far inland as this. Of terns, I have so far seen but one Black Tern. It lingered for a few moments over a rather large slough on July 20, 1910.

A rarity for this part of the country was captured on November 11, 1911, in the shape of a Cackling Goose (*Branta canadensis minima*). It mingled with the ducks of a farmer on the creek, and, when these wended their way homeward in the evening, this northern visitor came along and was caught by the farmer's sons. I secured it and kept it alive until April 18. During this memorably cold winter, it preferred standing on the snowdrifts in its yard to staying on the straw in its hut. It refused all food except chicken feed of cracked corn, oats, etc. Later, when the flocks of geese were flying to and fro overhead — this is evidently on the highway of goose migration — the little cackling member of the tribe would signal from below, whereupon the flocks would often halt, break ranks, apparently hold a consultation, and then pass on. Its repertoire of notes — call notes and low chucklings — was quite extensive; some of them were decidedly musical, reminding one of the Redwing, Cowbird or Bobolink in late summer, others were somewhat chicken-like. When in April that particular cracked corn etc. could not, for a time, be had, the little cackler refused the choicest whole corn, or food from the kitchen and deliberately starved to death. It proved a female; a large pellet of shot was lodged against one of the wingbones, which explains the seeming lack of shyness on the day of its capture. The length was $21\frac{3}{4}$ inches, wing 14 inches, tarsus $2\frac{7}{8}$ inches.

Canada Geese (*Branta canadensis canadensis*) pass through here from January 19 (1912) to April 22 (1910). Last fall a Snow Goose (sp. ?) was taken out of a flock of 26 in a nearby slough.

In the above mentioned piece of timber the Black-crowned Night Herons (*Nycticorax nycticorax naevius*) have a nesting colony of about thirty pairs. The nests are from thirty to fifty feet up in ash and oak trees.

On May 10, 1910, while walking — or rather stumbling — through a slough, I took a Wilson's Phalarope (*Steganopus tricolor*).

While this species is not so rare in Cook County, even nesting in the extensive Calumet marshes, this is the first record, so far as the writer is aware, for Du Page County.

What birds are able to go through occasionally, without succumbing, was illustrated by a Pectoral Sandpiper (*Pisobia maculata*) which came into my hands April 20, 1910. One leg above the tarsus must have been broken some time previously, but the bones had grown together, with the foot and tarsus turned around, so that the bird was walking with one foot directed forward and the other backward. On the abdomen was a scab over an old wound with a cleft in the center an eighth of an inch deep! This must have been done by a shot or by flying against a barbed wire fence.

During the extremely hot summer of 1911 flocks of northern shore-birds were here early in July, frequenting the pastures along the creek or around the sloughs. They then were still in their almost perfect nuptial plumage and thus unusually handsome specimens of Pectoral, Red-backed and Solitary Sandpipers, of Greater and Lesser Yellow-legs, and of the Least and Semipalmated Sandpipers were to be seen. It is surprising how late the Greater Yellowlegs remain here on their northward journey — into the last week of May — and how soon they are back again, namely by the end of June and beginning of July. These are undoubtedly non-breeding birds, that do not go very far north.

On May 10, 1910, I saw a flock of about fifteen beautiful Golden Plover (*Charadrius dominicus dominicus*), also three on May 9, 1912. They are becoming rather rare in this region.

The Bob-white (*Colinus virginianus virginianus*) has become very rare in this immediate vicinity, and of the Prairie Chicken (*Tympanuchus americanus americanus*) there is but one small covey on a farm nearby, where they are protected.

When we come to the *Fringillidæ*, however, the outlook brightens for this section, although here too the rarity of the Chipping Sparrow militates against it. Redpolls and Pine Siskins are plentiful some days in autumn, winter or spring, and even the northern Grosbeaks put in an appearance from time to time. But it is for Longspurs that the region is a veritable paradise. On the exposed,

wind-swept fields they may be seen from October to May, although they sometimes seem to disappear for a few days or weeks when the winds of winter are at their highest. I said, they may be seen; that is however only partly true, for when they are on the ground, busily gleaning seeds, their color is so obliterative, that one does not see them before they are almost stepped upon and take wing. When, however, in May they have their almost perfect nuptial plumage, the males are more conspicuous, owing to the deep black throat, but even then only when moving, as the white band on the side of the neck serves to break up the outline of the form of the bird. May 4, 1912, the fields, especially newly sown oat-fields, were literally alive with thousands of *Calcarius lapponicus lapponicus*, most in their fine breeding dress. Next day the clouds of them had disappeared; a few stragglers, however, were seen as late as May 9. Among the hordes of *C. lapponicus* now and then a Smith's Longspur (*Calcarius pictus*) may be seen, a male of which I took May 1, 1912, the first record for the county.

A greater surprise awaited me on April 20, 1912, when, in walking over the old fields nearby, I saw among the many *lapponicus*, five Chestnut-collared Longspurs (*Calcarius ornatus*). I was without a gun, but they let me approach to within fifteen feet, where I watched them at leisure through the glass. I hurried home and looked at a skin of the species in my collection, from their breeding grounds, took my gun and hurried out, but did not see them again. The buffy throat of *ornatus* can, of course, not be confounded with the deep black of *lapponicus*, especially after one has seen thousands of the latter, in all plumages, and they were even then present in numbers.

Nelson's Sparrow (*Passerherbulus nelsoni nelsoni*) I have taken twice, on August 31, 1910, and on September 16, 1911. There is only one previous record of this species for Du Page County, by Mr. B. T. Gault, who writes me that a female was taken at Glen Ellyn on October 2, 1893.

For Henslow's Sparrow (*Passerherbulus henslowi henslowi*) I have an earlier date than that given for this species in Woodruff's 'Birds of the Chicago Area,' namely March 28, (1910), while it is there stated to arrive about the middle of April.

While the Dickcissel (*Spiza americana*) was very common in 1911, it was absent here this year (1912).

The Lark Sparrow (*Chondestes grammacus grammacus*) is very rare; the only small breeding colony I have seen in three years I discovered in a clearing, adjoining some fields, on April 27, 1912.

Of the rarer warblers, I have once seen the Prothonotary (*Protonotaria citrea*), a female, on May 27, 1910. The Cerulean (*Dendroica cerulea*) and Golden-winged (*Vermivora chrysoptera*) have been seen once or twice each, the former in June, indicating breeding. For the Prothonotary it is the third record for the county, according to Mr. Gault. The Connecticut Warbler (*Oporornis agilis*), so rare in most places, is rather common on some days during spring migration. The same holds good for the Gray-cheeked Thrush (*Hylocichla aliciae aliciae*). On certain days during the last week or ten days in May, they may be seen by hundreds in the woods, which would seem to indicate that we are here on one of their highways of spring migration.

BREEDING BIRDS OF ALACHUA COUNTY, FLORIDA.

BY OSCAR E. BAYNARD.

ALACHUA COUNTY in middle Florida is one of the richest parts of the State so far as its bird life is concerned. This is due to the diversified character of the county. The middle and western parts are rolling with plenty of pine forests, while in the southeastern part is the low lake region with dense hammocks and cypress swamps and higher tracts of pine forests. The greater part of my observation and collecting has been carried on within a radius of twenty miles of Micanopy with several trips to the Suwanee River region.

Owing to the tropical character of the lake region this County is apparently the northern breeding limit of several species.

Out of about one hundred and forty birds that breed in the State, I have found, during the past nine years, ninety-eight breeding in Alachua County, and on my place about two miles east of Micanopy sixty-six. These I have marked with a * in the list.

Bird Island, Orange Lake Reservation of the National Association of Audubon Societies is situated in this county as well as one other protected reservation, and one other large rookery will in all probability be guarded next year. There are probably more Egrets in the county than in all the rest of the State and with the vigorous protection that they are now receiving here it is hoped that they may be the means of repopulating the State with this showy and valuable bird. Water birds are now as plentiful on our flooded prairies and ponds as in the old days that we all thought had passed. In the following list I have added at the end of each paragraph the dates when I have found eggs in the nest.

*1. **Podilymbus podiceps.** PIED-BILLED GREBE.—Resident throughout the year. Not very abundant, however, in the breeding season. Nests about June 1.

*2. **Anhinga anhinga.** ANHINGA, WATER TURKEY.—Resident in great numbers. Begins to lay as early as March 10. Usually rears but one brood, but a persistent layer if disturbed, laying as many as five sets.

3. **Phalacrocorax auritus floridanus.** FLORIDA CORMORANT.—A regular visitor but an irregular breeder. Have only known of its breeding here on two occasions; once in large Cypress Swamp and once on Bird Island in Orange Lake. Nests April 10.

*4. **Anas fuvigula fuvigula.** FLORIDA DUCK.—Unknown in this county to all the old duck hunters until 1906 when it appeared on Paines Prairie and other similar places and began to nest. Resident now and appears to be increasing in numbers. Builds on islands or tussocks in the lakes and also out on the edges in the tall marsh grass and dry sedge. A specimen we have in confinement, caught when young, has mated for two years with a wild Mallard drake and has laid many eggs, none of which however have hatched. Fresh eggs about April 15.

*5. **Aix sponsa.** WOOD DUCK.—Resident throughout the year. Breeds during April and May. This beautiful Summer Duck is becoming yearly scarcer here owing to the summer shooting when the young are unable to fly well. I believe they sometimes rear two broods.

6. **Guara alba.** WHITE IBIS, CURLEW.—A regular summer visitor until 1909 when they came in the early spring and began to nest on Bird Island in Orange Lake, where they have increased steadily. Arriving about April 1, they immediately begin nest building. Usually lay three eggs, rarely four. The young are considered good eating and many fall to the guns of the so called hunters.

7. **Plegadis autumnalis**. GLOSSY IBIS, BLACK CURLEW.—I first found this rare and beautiful bird breeding here in 1909 on Bird Island in Orange Lake. Nests April 1 to May 1. Will lay two to three sets if disturbed.

8. **Mycteria americana**. WOOD IBIS, FLINT HEAD.—The last breeding record I have for this County is 1906, when they bred in numbers in a Cypress Swamp in the northeastern part of the county. This rookery of about 1500 nests was nearly exterminated by men and boys who shot the young from the trees, evidently just to see them fall. After the nesting season they come here and feed all summer on our lakes. Fresh eggs about March 15.

9. **Botaurus lentiginosus**. BITTERN.—Resident throughout the year but a rare breeder. One nest found June 15, 1911, near Micanopy by H. H. Simpson.

*10. **Ixobrychus exilis**. LEAST BITTERN.—An abundant resident. Commences to nest in early April, and usually rears two broods.

*11. **Ixobrychus neoxenus**. CORY'S LEAST BITTERN.—Very rare and found only during four years of the nine I have lived in the county. Almost always found in or near small saw grass patches on two certain lakes. Probably more abundant than would appear from its fondness for the almost impenetrable saw grass. Fresh eggs April 20.

12. **Ardea herodias wardi**. WARD'S HERON.—Abundant and resident. Nests in large numbers in rookeries in cypress swamps in February and early March. Have found a few, however, nesting with the small Herons and Egrets in willow ponds and on Bird Island.

13. **Herodias egretta**. EGRET, LONG WHITE.—This beautiful bird was fairly abundant when I first came here, but is now limited to about 300 pairs, nearly all of which are in our protected rookeries. April 1 to 15.

*14. **Egretta candidissima candidissima**. SNOWY EGRET.—Never very abundant during my residence here. Our protected rookeries here shelter the remnant of this showy bird. Not over 250 pairs now left and these have increased from the four pairs that I began guarding three years ago. March 25 to April 10.

*15. **Dichromanassa rufescens**. REDDISH EGRET.—Abundant during 1907 and 1908. Found about 1500 pairs on Bird Island and many straggling pairs in many other localities. One pair only nested in 1911, and have only seen one pair this year.

*16. **Hydranassa tricolor ruficollis**. LOUISIANA HERON.—Abundant and breeds in great numbers throughout the county. March 20 to April 10.

*17. **Florida cærulea**. LITTLE BLUE HERON.—Abundant, in fact the most numerous of all the Herons, breeding in all parts of the county in small ponds in woods, fields and swamps and islands in the lakes. March 20 to April 10.

*18. **Butorides virescens virescens**. GREEN HERON.—Found in all parts of the County, occasionally breeding alone, but more often in rookeries with other Herons. April 1 to 30.

19. *Nycticorax nycticorax naevius*. BLACK-CROWNED NIGHT HERON.— This heron, locally called the 'Night Scrooglin,' is abundant and breeds usually earlier than the other herons. Builds in a cypress swamp as a rule, but many are found on Bird Island. March 1 to 15.

20. *Nyctanassa violacea*. YELLOW-CROWNED NIGHT HERON.— Not as abundant as the preceding species. Have found them nesting in the same swamp, but never with them. Nests March 25 to April 10.

21. *Grus mexicana*. SANDHILL CRANE.— Resident but rare. Nests in late April on the flooded prairies of two lakes.

22. *Aramus vociferus*. LIMP KIN.— This strange bird was fairly abundant here formerly, but is now a very rare breeder and in only one swamp to my knowledge. Breeds from November to June, the height of the breeding season being in April and May. I fear that this bird will soon be extinct in the State.

23. *Rallus elegans*. KING RAIL.— Resident but only tolerably common. Nests in early May in the marshes of our lakes.

*24. *Creciscus jamaicensis*. BLACK RAIL.— Summer resident but very rare. Never found a nest but saw an adult with three young on one occasion in early June.

*25. *Ionornis martinicus*. PURPLE GALLINULE.— An abundant resident, and breeds on all the lakes and ponds where the Bonnetts (*Nuphar advena*) is abundant. Nests from March to August and usually rears two broods.

*26. *Gallinula galeata*. FLORIDA GALLINULE.— Common resident, but not as abundant as the preceding species. Nests from March to July. Inhabits practically the same localities as the Purple Gallinule but usually nests nearer to the water and in the floating masses of Penny-wort (*Hydrocotyle ranunculoides*), the eggs being sometimes wet.

27. *Fulica americana*. COOT.— Here in thousands during the winter and many remain during the entire year. A very rare breeder, found one nest being occupied but eggs were not laid in it for some reason. Killed two females in June of this year, full of eggs that would have been ready to lay in a week's time. I have no doubt but that it does nest here occasionally.

28. *Philohela minor*. WOODCOCK.— Resident, but rare. Two nests found this year on February 4, by H. H. Simpson, near Micanopy. One nest contained a set of three eggs, the other had been broken up. This is the second breeding record I know of for Florida.

*29. *Oxyechus vociferus*. KILLDEER.— Abundant resident, nests here in fields near some pond or lake in early April.

*30. *Colinus virginianus floridanus*. FLORIDA BOB-WHITE.— An abundant resident and despite the great numbers killed annually, seems to be more than holding its own. Nests in early April and usually rears two broods. Have found nest with eggs as late as Sept. 15.

31. *Meleagris gallopavo osceola*. FLORIDA WILD TURKEY.— This noble game bird is rapidly nearing extermination in this section, due not so

much to hunting, as to the cultivation of the hammocks and woods where it nests. Full sets are found here about April 15.

*32. *Zenaidura macroura carolinensis*. MOURNING DOVE.—Resident and seems to be increasing notwithstanding it is a game bird. This is due to the education of our farmers who are beginning to realize the great worth of the Dove. Fresh sets May 1.

*33. *Chæmepelia passerina terrestris*. GROUND DOVE.—Abundant and resident. Known locally as the 'Moaning Dove.' Have found them breeding every month of the year except December and January. Builds as often in orange trees as on the ground.

34. *Cathartes aura septentrionalis*. TURKEY VULTURE.—Common resident and breeds here to some extent in April and early May.

*35. *Catharista urubu*. BLACK VULTURE, CARRION CROW.—An abundant, resident species, nesting in the county by the thousands in the thick swamps, hammocks, and saw palmetto patches. Nests from February to June. Young are about fourteen weeks old before they can fly.

*36. *Circus hudsonius*. MARSH HAWK.—A common resident and pretty generally protected by the farmers who know it as the 'Rabbit Hawk.'—Nests here on our lakes on the high tussocks of saw grass and *Sagittaria* in May and early June.

37. *Accipiter velox*. SHARP-SHINNED HAWK.—Every man's hand here is against the 'Blue Darter,' and it is not as abundant as formerly when it bred in great numbers from April 15 to May 1.

38. *Accipiter cooperi*. COOPER'S HAWK.—Rare. Have found only two nests in the county in nine years. Fresh eggs about March 15.

39. *Buteo borealis borealis*. RED-TAILED HAWK.—Resident but rare. Nests in very tall pines early in March.

*40. *Buteo lineatus alleni*. FLORIDA RED-SHOULDERED HAWK.—Resident and fairly abundant. Nests from February 15 to March 25.

41. *Buteo platypterus*. BROAD-WINGED HAWK.—A very rare bird for this section and found only one nest with two young on May 28, 1909.

42. *Haliaeetus leucocephalus leucocephalus*. BALD EAGLE.—Resident and formerly tolerably common, having known of 20 occupied nests in one year. Not holding its own now as every hog raiser in the county kills every one he can on account of the Eagle's perverted taste for razor back pig. Nests about the 10th of December in the tallest pine trees we have and often lays a second set if first is disturbed. Usually lays two eggs.

*43. *Falco sparverius paulus*. LITTLE SPARROW HAWK.—A common resident and pretty evenly distributed throughout the county. Seldom molested as its great love for grasshoppers is well known to the farmers. Usually nests about April 15.

44. *Pandion haliaëtus carolinensis*. OSPREY.—Abundant and increasing rapidly. Very erratic in its nesting, and fresh eggs can be found from early February to late May.

45. **Aluco pratincola.** BARN OWL.—A very rare resident and only found near Paines Prairie. Nests in early November.

*46. **Strix varia alleni.** FLORIDA BARRED OWL.—A common resident and abundant in the hammock regions. Seldom molested as their fondness for rabbits is well known. Nests about January 10.

*47. **Otus asio floridanus.** FLORIDA SCREECH OWL.—An abundant resident and breeds April 10 to 25.

48. **Bubo virginianus virginianus.** GREAT HORNED OWL.—Resident but our rarest owl. Breeds here about January 15, usually in an old Eagle's nest.

*49. **Coccyzus americanus americanus.** YELLOW-BILLED CUCKOO.—A common breeder and pretty evenly distributed. Nests from late April to August.

*50. **Ceryle alcyon alcyon.** BELTED KINGFISHER.—Common resident and nests in early April in holes in dead trees and stubs over water. Never found them nesting in cavities in banks as in the north.

51. **Campephilus principalis.** IVORY-BILLED WOODPECKER.—Very rare. Found one nest in the County that contained young. Fresh eggs about February 15.

52. **Dryobates villosus auduboni.** SOUTHERN HAIRY WOODPECKER.—Rare; nests here in very limited numbers in late April and early May.

53. **Dryobates pubescens pubescens.** SOUTHERN DOWNY WOODPECKER.—Regularly nests here in limited numbers in May.

*54. **Dryobates borealis.** RED-CKADED WOODPECKER.—Not very common until the last three years, but now a common breeder. Nests about May 1.

*55. **Phlœotomus pileatus pileatus.** PILEATED WOODPECKER.—The 'Lord-God,' as he is known in this section, is one of the commonest woodpeckers in the county nesting in the hammocks and cypress swamps in early April.

*56. **Melanerpes erythrocephalus.** RED-HEADED WOODPECKER.—Abundant, nesting from early May to late June.

*57. **Centurus carolinus.** RED-BELLIED WOODPECKER.—Common resident and nests April 1 to May 15.

*58. **Colaptes auratus auratus.** FLICKER.—Abundant and nests from March to June.

*59. **Antrostomus carolinensis.** CHUCK-WILL'S-WIDOW.—Common and nests from April 10 to June 1.

*60. **Chordeiles virginianus chapmani.** FLORIDA NIGHTHAWK.—An abundant summer resident and nests from April 15 to late in May.

*61. **Chætura pelagica.** CHIMNEY SWIFT.—Summer resident but only tolerably common. Nests from May 15 to June 10.

*62. **Archilochus colubris.** RUBY-THROATED HUMMINGBIRD.—Common and nests from May 10 to June 25.

*63. **Tyrannus tyrannus.** KINGBIRD.—Very abundant, nesting about May 10.

*64. *Myiarchus crinitus*. CRESTED FLYCATCHER.— Abundant, nesting about May 10.

*65. *Myiochanes virens*. WOOD PEWEE.— Rare, nests in early June.

*66. *Cyanocitta cristata florincola*. FLORIDA BLUE JAY.— Abundant, nesting from early March to July.

67. *Aphelocoma cyanea*. FLORIDA JAY.— Very rare and only found nesting in the county once. April 16.

*68. *Corvus brachyrhynchos pascuus*. FLORIDA CROW.— Resident but in limited numbers, nesting from late March to April 15.

*69. *Corvus ossifragus*. FISH CROW.— Abundant, large numbers using Bird Island for a roost. Nests in late April in tall slim pines on edges of the lakes.

*70. *Agelaius phoeniceus floridanus*. FLORIDA RED-WING.— Very abundant resident and nests from March 15 to July 15. Raises two and three broods.

71. *Sturnella magna argutula*. SOUTHERN MEADOWLARK.— Locally abundant in some parts of the county. Nests late in April.

*72. *Icterus spurius*. ORCHARD ORIOLE.— A rare summer visitor nesting in early June.

*73. *Quiscalus quiscula aglæus*. FLORIDA GRACKLE.— Abundant resident breeding in April and May in orange and pear groves and occasionally in a small pine on the edge of some lake.

*74. *Megaquiscalus major major*. BOAT-TAILED GRACKLE, JACKDAW.— Our most abundant blackbird, resident, and nests from March 1 to July, usually rears two broods.

75. *Ammodramus savannarum floridanus*. FLORIDA GRASSHOPPER SPARROW.— Very rare and probably nests in May as found one pair with young that could barely fly late in June on Paines Prairie.

*76. *Peuceea æstivalis æstivalis*. PINE-WOODS SPARROW.— Tolerably common and nests from April 15 to 30.

*77. *Pipilo erythrophthalmus alleni*. WHITE-EYED TOWHEE, JOREE.— Abundant resident and nests in April, May and June. Some years apparently more abundant than others.

*78. *Cardinalis cardinalis floridanus*. FLORIDA CARDINAL.— Abundant resident, breeding from April to September. Found nest with young September 15, 1910.

*79. *Piranga rubra rubra*. SUMMER TANAGER.— Common and nests in early May.

*80. *Progne subis subis*. PURPLE MARTIN.— Common breeder and nests from April 1 to May 1.

*81. *Lanius ludovicianus ludovicianus*. LOGGERHEAD SHRIKE.— Abundant resident, nesting from early February to July. Rears two to three broods.

*82. *Vireosylva olivacea*. RED-EYED VIREO.— Common, nests in early May.

*83. *Vireo griseus griseus*. WHITE-EYED VIREO.— Abundant, nesting from April 1 to May 15.

*84. *Compsothlypis americana americana*. PARULA WARBLER.— Abundant and nests in early April in the cypress swamps.

*85. *Dendroica vigorsi*. PINE WARBLER.— Common, nesting in early March in the highest pines in a bunch of the pendant Florida Long Moss.

*86. *Geothlypis trichas ignota*. FLORIDA YELLOW-THROAT.— Very abundant around lakes and swamps and nests in late April and early May.

*87. *Dendroica discolor*. PRAIRIE WARBLER.— Not common, nesting in late April.

*88. *Mimus polyglottos polyglottos*. MOCKINGBIRD.— Abundant, resident, nesting from March to August.

*89. *Dumetella carolinensis*. CATBIRD.— Common winter resident, but a rare breeder. Nests about April 15.

*90. *Toxostoma rufum*. BROWN THRASHER.— Common winter resident and breeds in small numbers about April 16.

*91. *Thryothorus ludovicianus miamensis*. FLORIDA WREN.— Abundant and bred here in great numbers until past two years, when, for some cause, they moved further south. Still common, however. Nests from March to July and rears two or more broods. One set of eggs I collected at Micanopy are typical eggs of the Carolina Wren, and the bird as seen at very close range I took to be the Carolina Wren. I note, however, that Mr. Ridgway regards all our county birds as the Florida Wren and Mr. Stone also assures me that the Carolina Wren does not nest in Florida.

92. *Sitta carolinensis atkinsi*. FLORIDA WHITE-BREASTED NUTHATCH.— Rare; breeds here in early March in small numbers.

93. *Sitta pusilla*. BROWN-HEADED NUTHATCH.— Abundant and breeds from February to May, usually rearing two broods.

*94. *Bæolophus bicolor*. TUFTED TITMOUSE.— Abundant and nests from early February until April.

*95. *Penthestes carolinensis*. CAROLINA CHICKADEE.— Common breeder from early February until June.

*96. *Polioptila cærulea cærulea*. BLUE-GRAY GNATCATCHER.— Common resident and breeds in early April.

*97. *Sialia sialis sialis*. BLUEBIRD.— Common resident and nests from March to June.

98. *Passer domesticus*. ENGLISH SPARROW.— This pernicious nuisance is abundant over the entire county.

WHAT THE AMERICAN BIRD BANDING ASSOCIATION
HAS ACCOMPLISHED DURING 1912.¹BY HOWARD H. CLEAVES.²

SINCE it is obvious that this report will fall into the hands of many who are not cognizant of the facts relating to the origin, growth and present status of the bird banding movement in America it might not be amiss to devote a brief space at the outset to a review of that phase of the subject. The mystery of bird migration has tickled and agitated the lay mind and engaged the attention of the ornithologist for we know not how long, and although much has been ascertained by field observers with regard to dates of arrival and departure at given points of the majority of migratory species, practically nothing is known of the movements of individual birds. Even Audubon became interested in this problem, for we read that he placed silver wire rings about the tarsi of a brood of young Phœbes and was rewarded the following year by discovering two of these birds nesting in the same vicinity. Whether through reading of this interesting incident, or hearing of the splendid efforts put forth by certain Europeans who began banding birds as early as 1899, or by reason of a spontaneous desire to investigate, it would be difficult to tell, but the fact remains that not later than 1902 individual experimenters in this country engaged themselves in earnest and comparatively extensive efforts to cast light on the wanderings of birds by the use of inscribed metal bands or rings.

Not until 1908, however, did anything approaching a concerted bird banding movement develop. During that year certain members of the New Haven (Conn.) Bird Club did a small amount of banding, but, realizing how unavailing were the efforts of so few, decided to carry the cause before the Congress of the American Ornithologists' Union at Cambridge, Mass., in November. There

¹ For previous reports of bird banding work in America see 'The Auk,' Vol. XXVI, No. 2, pp. 137-143, April, 1909, and 'The Auk,' Vol. XXVII, No. 2, April, 1910.

² Address communications to Howard H. Cleaves, Sec'y-Treas., Public Museum, New Brighton, N. Y.

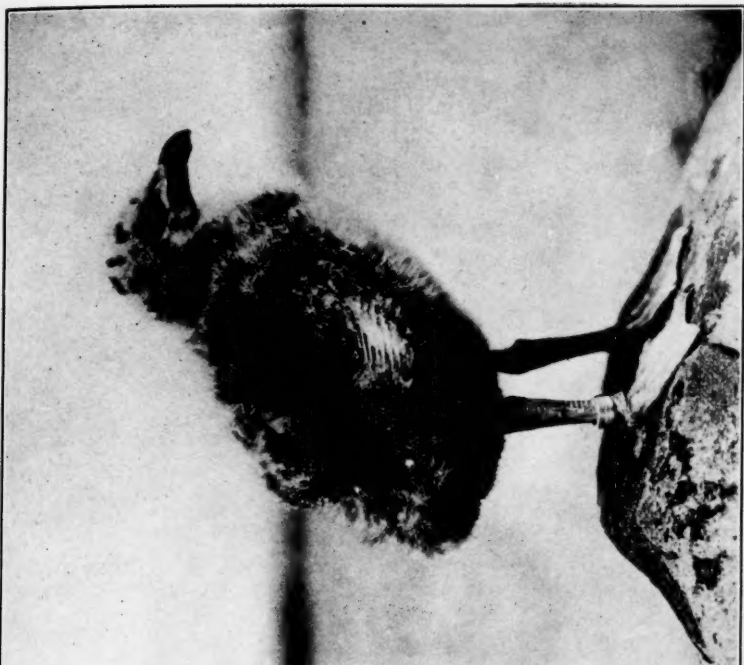
it met with favor and the demand by members of the Union for bands became so pronounced that 5000 were issued prior to the close of the nesting period in 1909. Of this number approximately 1000 were actually placed on birds, and there resulted from these about 30 return records by the end of the year. With interest aroused, the time seemed ripe to give the movement a more concrete form than it had hitherto assumed, the result being that some thirty members of the A. O. U. assembled in New York on the evening of December 8, 1909, and organized the American Bird Banding Association.

Dr. Leon J. Cole, who had been so successfully pushing the work, was chosen President, and together with four able colleagues made up the Executive Committee. In the spring of 1910, however, Dr. Cole was permanently called to Madison, Wis., and partly as a result of his absence, and also on account of the pressing business affairs of all members of the Committee and their widely separated places of residence, the activities of the Association were destined to meet with a serious setback. Practically nothing was accomplished during 1910 nor in 1911, but in the fall of the latter year the Linnaean Society of New York offered to foster the work, much to the relief of those previously encumbered with it. A committee (consisting at first of three and subsequently of five) was appointed and a campaign to raise funds in preparation for the nesting season of 1912 was inaugurated and carried forward with considerable success.

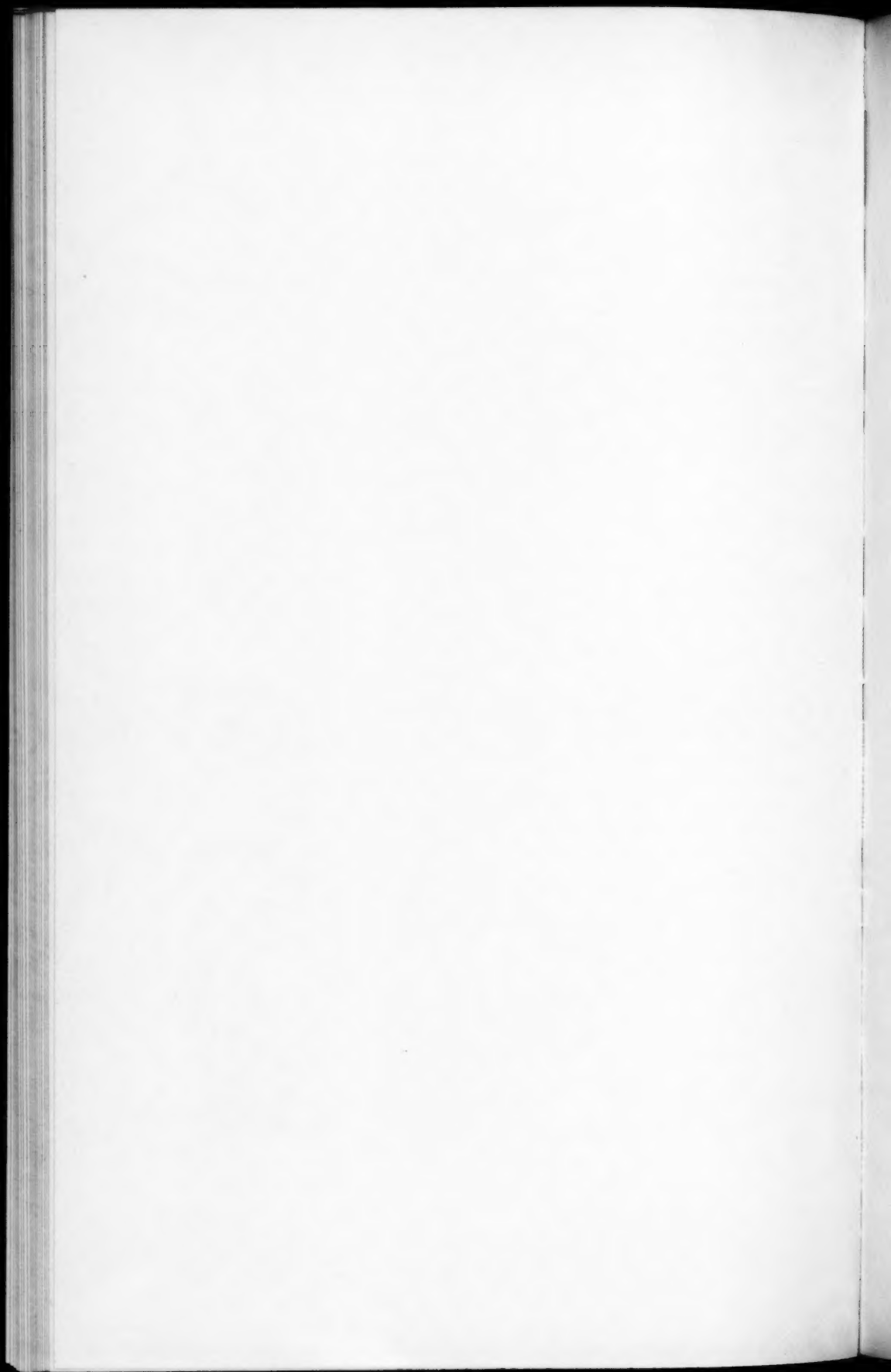
At the outset a change in the type of bands seemed advisable and after inquiring among as many as six different European bird banding organizations the style used by Country Life, London, was adopted. Seven thousand five hundred of these bands, of eight different sizes and bearing the inscription 'NOTIFY AM MUSEUM N. Y' instead of 'NOTIFY THE AUK N Y' were ordered. For the purpose of keeping an exact record of every band issued a special ledger was designed and a filing cabinet for record cards and correspondence was purchased. As the spring of 1912 approached post cards were sent out requesting that applications for bands be submitted. So vigorous was the response resulting from these cards and from notices in 'The Auk,' 'Bird-Lore,' 'Country Life in America' and elsewhere, that four thousand one hundred and

seventy-three bands were distributed among forty-four persons residing in various parts of the country, and representing such widely separated territories as Nova Scotia, Montana and Florida. All told, eight hundred of the bands issued this year (1912) have been actually placed on birds and some of these have already yielded return records possessing a high degree of interest. The total number of *species* banded during the past season is seventy-three, of which the following is a summary:

Species.	No. banded in 1912.	Species.	No. banded in 1912.
Black Guillemot	2	Great Crested Flycatcher	5
Great Black-backed Gull	41	Phoebe	19
Herring Gull	72	Olive-sided Flycatcher	2
Least Tern	7	Blue Jay	9
Leach's Petrel	21	Western Crow	2
White Ibis	28	Bobolink	1
Glossy Ibis	10	Cowbird	2
Bittern	1	Red-winged Blackbird	4
American Egret	145	Thick-billed Redwing	8
Snowy Egret	30	Meadowlark	6
Louisiana Heron	21	Western Meadowlark	5
Little Blue Heron	17	Orchard Oriole	1
Green Heron	2	Brewer's Blackbird	18
Black-crowned Night Heron	10	Purple Grackle	1
Spotted Sandpiper	19	House Finch	1
Killdeer	2	Chestnut-collared Longspur	1
Piping Plover	3	Western Vesper Sparrow	1
Mourning Dove	4	House Sparrow	1
Marsh Hawk	4	Savannah Sparrow	20
Barn Owl	6	White-throated Sparrow	1
Short-eared Owl	8	Chipping Sparrow	6
Screech Owl	2	Field Sparrow	4
Yellow-billed Cuckoo	3	Slate-colored Junco	9
Yellow-bellied Sapsucker	1	Song Sparrow	15
Red-headed Woodpecker	2	Towhee	2
Flicker	25	Cardinal	3
Chimney Swift	5	Rosebreasted Grosbeak	1
Arkansas Kingbird	10	Indigo Bunting	3



1. BANDING BLACK-BACKED GULLS IN THE LAKE GEORGE, N. S., COLONY.
2. YOUNG BLACK-BACKED GULL WITH BAND ON FOOT.



Species.	No. banded in 1912.	Species.	No. banded in 1912.
Dickcissel	2	Louisiana Water-Thrush	3
Scarlet Tanager	2	Catbird	7
Purple Martin	3	Brown Thrasher	9
Barn Swallow	49	Chickadee	5
Red-eyed Vireo	3	Wood Thrush	4
Black and White Warbler	1	Robin	22
Yellow Warbler	8	Western Robin	12
Myrtle Warbler	1	Bluebird	16
Black-throated Green Warbler	1		

The activity of certain of the banders in the field has been remarkable and their observations often noteworthy. For instance, Mr. Oscar E. Baynard, in charge of Bird Island in Orange Lake, Florida, writes that in placing some two hundred and fifty bands on White and Glossy Ibises, Egrets, and Louisiana, Black-crowned Night and Green Herons it was necessary for him to wade about up to his knees in soft mud and guano while the temperature averaged ninety-four degrees in the shade. Mr. Baynard says further:

"I note a White Ibis that I banded last year is nesting here this year, although I cannot determine the number. Have noted two long whites nesting here this year that were here last year — one adult with deformed leg and a youngster with a deformed foot. This last year's youngster has a nest of its own this year and the old one has built in the same bush she used last year. Next year I'll probably be able to note a lot of banded birds returning here to nest."

Mr. A. A. Saunders, of the Forest Service of Montana, is practically the only person doing any banding work in the west, but he is a host in himself and loses no opportunity to put his bands to good use while ranging over his territory. In a letter dated June 25, 1912, Mr. Saunders says:

"I was recently told of an incident of a marked bird returning to the place where it was born, and got as many of the facts as possible, as I believe they will be of interest to the association. The incident was told me by Mr. E. A. Woods, a Forest Ranger on the Lewis and Clark National Forest, and while this information

comes second hand, I believe it is correct. A lady living near Mountain View, Alberta, just north of the United States boundary, found the nest of a Canada Goose and hatched out the eggs under a hen. The young geese lived in the barnyard that summer, and one was marked, by fastening a bell around its neck. In the fall, when a flock of migrating geese flew over, the geese left the barnyard, and joined this flock. Two years later, in the spring, the goose wearing the bell returned and stopped in the barnyard for a few days."

Mr. Ernest Harold Baynes, of Meriden, New Hampshire, is one of the most energetic and faithful banders at present engaged in the work, notwithstanding his many other activities. He tells of a flock of 125 White-winged Crossbills that fed near his home last winter. The birds were so tame that Mr. Baynes had but to stoop and pick them up when he wished to place bands on their legs. Members of the Meriden Bird Club have put up many nesting boxes for Chickadees, Bluebirds, etc., and numbers of these small birds have been banded. Indeed, it goes without saying that any bird that falls into the hands of Mr. Baynes wears a ring on its leg when released.

Mr. Harrison F. Lewis, of Yarmouth, Nova Scotia, is another who has accomplished much in the matter of banding the smaller birds. Mr. Lewis told me that when the school children living in the country near him heard of his banding work they all set out to find birds' nests and report them to him. Thus a double end was accomplished — Mr. Lewis was enabled to band dozens of birds without spending much of his own valuable time in looking for nests; and, best of all, the children of the countryside suddenly took a rousing interest in bird life, although perhaps unwittingly. What these children were really keen about was to watch the placing of the tiny aluminum bands on the birds' legs, but to locate the young birds the nests had to be found and in order to find the nests it was necessary to follow the movements and watch the habits of the old birds. It is often difficult to induce children simply to observe things if they think you are trying to make them acquire some knowledge by doing so, but here was a new idea, a material end to be accomplished — something to do. There is no reason why the work of banding birds should not work a similar miracle among

adults — it adds a vigorous interest to bird study; arouses latent interest; or even preserves interest when it tends to wane.

These few cases of the activities of field agents are cited as examples of what hundreds of ornithologists should be doing throughout the continent of North America. Bird banding is not the work of a limited circle but the duty of many, and it is only by extensive banding that results of value can be obtained. Realizing these facts, it has been thought best to welcome the cooperation of all competent bird lovers, regardless of the matter of contributions or annual dues. Any one deemed properly qualified by the Committee may apply for bands and will receive them. On the other hand it is hoped that there are enough people who sufficiently appreciate the value of the work to sustain the necessary financial burden.

A year ago many persons declined to support the work of bird banding on the grounds that not sufficient results had been obtained to establish its practicability. The following return records of banded birds, received within the past twelve months, should rob this objection of its foundation.

On June 7th, 1911, an adult Chimney Swift fluttered down a chimney into the study of Mr. Ernest Harold Baynes in Meriden, New Hampshire, and was promptly banded and released. The band was of the old style and bore the number 6326. At eight o'clock P. M. on June 15, 1912, two Chimney Swifts flew from the chimney into the same room of Mr. Baynes' house where the bird had been caught a year and eight days before. And lo! when these birds were taken in hand and examined one of them proved to be 6326. Remarkable as it may seem, this diminutive creature, less than six inches in length, had travelled hundreds of miles to Central America or elsewhere in the tropics where he spent the winter and then had made the long return journey at the approach of summer and found again the chimney of his choice in a village of far-off New Hampshire. And throughout his journeyings the little aluminum ring had travelled with him and had produced not the least effect on the bird's leg.

Two French Canadians were gunning along a small river near the hamlet of Whitebread in southwestern Ontario, Canada, on August 5, 1912. Blackbirds, their intended booty, were not

numerous and the men were about to return to camp when one suddenly touched the other on the arm and said "You cannot hit him!" In answer to this challenge the second gunner wheeled quickly about and took a difficult chance shot at a fast disappearing Common Tern. There were many terns flying up and down the stream, hovering in the air and plunging for minnows, and it seems strange that the one shot should have borne a band on his leg. The finding of that band resulted in the following letter:

"Dear Friends

As I have never seen you's before but I am writing a few lines to tell you about a ring or piece of tin I found on a sea gull or sea bird. There is thousands of them here but I will not try it again. In examining the bird I found on the left leg 'Notify the Auk or Ark 4590 New York.' So I am doing so to let you know how far this bird travelled. Well I will close. Please write back and let me know if you got this scribbling.

from

August 5th, 1912.

Leo Salois, Box 14, Whitebread, Ont."

On referring to number 4590 among the original banding records it was found that the bird in question had been marked when about two weeks old at Saint Clair Flats Canal, Michigan, on August 13th, 1909, by Mr. S. A. Courtis. By correspondence with Mr. Salois it was learned that the terns were apparently not nesting at Whitebread, Ontario, and it is not unlikely that the birds seen there had bred at Saint Clair Flats and were indulging in a little roving after the nesting season. However this may be, the facts remain that the dead Tern had worn the aluminum anklet for three years minus eight days; had likely made three round trips to the Gulf of Mexico or some other place in the tropics to spend the winter each year since 1909; and was shot but a comparatively short distance from the spot where he was hatched.

A farmer by the name of August Schilling of Evansville, Illinois, was walking across his fields on April 1, 1912, when he frightened a Butcher-bird from a fence post where it had been feeding on what proved to be a Bluebird. On picking up the victim and scrutinizing it Mr. Schilling was astonished to discover that the bird wore a ring on its right leg, and that the ring bore an inscription. He

wrote a letter to 'The Auk,' New York, giving the number of the band, and asked for information, saying:

"Please let me know when the band was put on. There are lots of people would like to know."

This particular Bluebird was one of a brood banded by Dr. R. M. Strong, of the University of Chicago, at West Allis, Wisconsin, on July 5, 1909. The band had been carried for two years and nine months and had apparently caused no inconvenience. It is probable that this Bluebird had made two complete migrations to the south and was about to complete the last lap of a third when he was so unfortunate as to cross the path of *Lanius borealis*.

The letters sent in by persons who have come into possession of banded birds are often intensely interesting, containing information regarding the conditions under which the bird was secured that makes a story of unique character when one goes to the filing cabinet, picks out the banding record and puts the two halves of the tale together. The following is a good example: The owner of a rice plantation on the Lower Cambahee River, Colleton County, South Carolina, sent in word that on November 2, 1912, his 'bird minder' (a man stationed with a gun in the 'rice yard' for the purpose of keeping birds away from the grain) had shot a number of Red-winged Blackbirds and was preparing them for a pot pie when he came upon one wearing a small metal band on its leg. What could be more fraught with interest? The man had, of course, given the number of the band and we at once picked out the card bearing the record of banding and supplied the other end of the story. We found that the bird was banded as a fledgling by Mr. Harry S. Hathaway at Quonochontaug, Charleston, Rhode Island, on June 8, 1912. On being notified of the 'return' Mr. Hathaway wrote:

"I well remember this young Red-wing. I was wading through a small cattail swamp looking for Red-wings' nests when I spied him clinging to a cattail about 2 feet from the water. I made a grab and had him in my hand and a band on in a jiffy. A toss in the air and he awkwardly flew some 20 feet and succeeded in grasping an upright cattail and clung there while I went on."

Who would have supposed that the young Red-wing, reared in a Rhode Island cattail swamp in June, would end his career in a pot pie in South Carolina five months later?

Almost every record that has come in is characterized by some distinguishing feature and would furnish reading matter as interesting as the several returns cited above. Lack of space, however, prevents the publication of these embellishments, although the reader may gather much from the banding and return records in their condensed form at the end of this paper. The percentage of returns, contrary to the predictions of some, has indeed been encouraging; and the point that should be emphasized in connection with these is that they have not in a single instance been due to the handicapping of the birds by the bands. This is proved, firstly, by the fact that the bands have been carried by the birds for such long periods; secondly, by reason of the very conditions attending the taking of each bird; and thirdly, by the fact that the presence of the band on the bird's leg was not in a single case detected until the bird was taken in the hand and examined, and therefore could not possibly have prompted any one to kill the bird for the purpose of recovering the band and satisfying his own curiosity. This sort of thing, by the way, is and should be strongly denounced and discouraged. It is rather the interest in watching for banded birds and even photographing them that should be encouraged.

It would not be wise to spring at conclusions with regard to the significance and meaning of the return records that have thus far been secured. The fact that Mr. Baynes' Chimney Swift returned to its old stand after an absence of nearly a year in the tropics is significant in itself; but before stating that, barring accident, Chimney Swifts invariably return year after year to the same chimney it would be advisable, not to say necessary, to obtain a dozen or even a hundred similar records as corroborative evidence.

Beyond a doubt the greatest progress in the work of banding birds in America has been made during the year just past, but the pace established in that time must be not only maintained but greatly increased. Our interest and enthusiasm must not decline for a moment; the work and aims of the American Bird Banding Association must receive the most zealous support that American ornithologists are capable of imparting.



1. YOUNG MOURNING DOVES, BANDED AT STATEN ISLAND, N. Y. CITY.
2. CHIMNEY SWIFT, BANDED AT MERIDEN, N. H.
3. BARN OWL, BANDED AT STATEN ISLAND, N. Y.



RETURN RECORDS.

(a) The returns in this division are from the old lot of bands issued by Dr. Cole in 1909.

7287. HERRING GULL. *Larus argentatus*.

Banded at Falls Pond, Hamilton
County, N. Y., by Francis
Harper.

June 27, 1910.
Downy young.

Recovered at Barnegat Inlet, N. J.,
by William H. Lewis.

September 11, 1911.
Found alive but apparently sick,
on the shore.

4590. COMMON TERN. *Sterna hirundo*.

Banded at Saint Clair Flats Canal,
Mich., by S. A. Courtis.

August 13, 1909.

About two weeks old. 'On bare
sandy island left from dredging
of new canals. Birds from one
to four weeks of age found
there.' S. A. C.

Recovered at Whitebread, Ontario,
Canada by Leo Salois.

August 5, 1912.

Shot: birds did not seem to be
breeding here and probably
wandered over from Saint Clair
Flats, after the breeding season.

6625. SPOTTED SANDPIPER. *Actitis macularia*.

Banded at House Is. (Four Bros.
Islds.) Lake Champlain, N. Y.
by Francis Harper.

July 7, 1910.

Downy young 'caught on July 8
and July 9, examined and
found to be in good condition.'
F. H.

Recovered at Squantum, Mass.,
by Hayden Crocker.

September 6, 1910.

Shot among a flock of smaller
sandpipers 'on a mudbank in a
salt marsh. Did not notice
band on leg until I was dressing
bird.' H. C.

5557. NORTHERN FLICKER. *Colaptes auratus luteus*.

Banded at Logan Park Cemetery,
Sioux City, Ia., by Prof. T. C.
Stephens.

June 11, 1910.

Male nestling, one of a brood of
seven.

Recovered at Bayard, Kas., by I.
Decker.

November 20, 1910.

Captured in a barn; injured in
capturing and afterwards killed.
Band was not noticed until the
bird was dead.

6326. CHIMNEY SWIFT. *Chatura pelagica*.

Banded at Meriden, Sullivan Co., N. H., by Ernest Harold Baynes.

June 7, 1911.

Adult: 'This bird and another came down the chimney and into my study at 8 p. m. It was almost dark when we liberated them.' E. H. B.

Recovered at Meriden, Sullivan Co., N. H., by Ernest Harold Baynes.

June 15, 1912.

Caught in a room. 'The leg to which the band was attached appeared normal in every way.' E. H. B.

955. RED-WINGED BLACKBIRD. *Agelaius phœniceus phœniceus*.

Banded at Berwyn, Chester Co., Pa., by Leonard S. Pearson.

June 6, 1909.

Fledgling: 'had just left nest.' L. S. P.

Recovered at Lansdowne, Delaware Co., Pa., by H. L. Henry.

September 1, 1909.

Shot.

5838. FIELD SPARROW. *Spizella pusilla pusilla*.

Banded at Sioux City, Ia., by Prof. T. C. Stephens.

June 11, 1910.

Fledgling.

Recovered at Sioux City, Ia., by A. Kirkegaard.

May 23, 1911.

No information as to how it was obtained.

3429. WESTERN HOUSE WREN. *Troglodytes ædon parkmani*.

Banded at Milwaukee, Ore., by William L. Finley.

July 31, 1909.

Nestling.

Recovered at Woodburn, Ore., by Son of J. G. Martzoff.

June 26, 1910.

Found in watering tank. Woodburn is about 30 miles south of Milwaukee.

251. ROBIN. *Planesticus migratorius migratorius*.

Banded at Kingston, R. I. (Orchard of Agricultural College) by Leon J. Cole and Wm. F. Kirkpatrick.

August 4, 1908.

Half-fledged bird from 'nest about 10 ft. up in an apple tree.'

L. J. C.

Recovered at Kingston, R. I. (Poultry plant of Agricultural College) by Wm. F. Kirkpatrick.

April 9, 1909.

'Presence of band was unknown until bird was in the hand. Specimen taken to aid in pathological work at station. Band had caused no abrasion or other injury to foot.'

L. J. C.

1212. ROBIN. *Planesticus migratorius migratorius*.

Banded at Bangor, Me., by Ora Willis Knight.

July 8, 1910.

'Young bird found on ground barely able to fly. Banded and released.' O. W. K.

Recovered at Nashville, Tenn., by J. G. Jenkins.

February 21, 1911.

'Captured.'

2376. ROBIN. *Planesticus migratorius migratorius*.

Banded at Westbrook, Cumberland Co., Me., by Arthur H. Norton.

July 21, 1909.

Nestling.

Recovered at Westbrook, Cumberland Co., Me., by Arthur H. Norton.

July 27, 1909.

Killed by a cat at night, bird left the nest July 27.

1271. ROBIN. *Planesticus migratorius migratorius*.

Banded at Portland, Me., by Ora Willis Knight.

July 29, 1912.

Fledgling just out of the nest.

Recovered at Portland, Me., by Chas. E. Foss.

August 3, 1912.

Killed by a cat on a lawn 'two and a half blocks north of spot where bird was banded.' O. W. K.

2816. BLUEBIRD. *Sialia sialis sialis*.

Banded at West Allis, Wis., by Dr. R. M. Strong.

July 5, 1909.

Nestling; 'one of a brood of several.' R. M. S.

Recovered at Evansville, Randolph Co., Ill., by August Schilling.

April 1, 1912.

Killed by a Northern Shrike, *Lanius borealis*.

6302. BLUEBIRD. *Sialia sialis sialis*.

Banded at Meriden, Sullivan Co., N. H., by Ernest Harold Baynes.

June 3, 1911.

About two weeks old 'one of a family of five in an unpainted wooden box, on the corner of an old shed.' E. H. B.

Recovered at Berlin Md., by son of a millhand in the employ of Charles W. Tingle.

January 20, 1912.

Shot together with others of a flock of Bluebirds.

(b) The following have resulted from the new lot of bands issued in the spring of 1912.

5804. GREAT BLACK-BACKED GULL. *Larus marinus.*
Banded at Lake George, Yarmouth Co., N. S., by Howard H. Cleaves.
 July 23, 1912.
 Fledgling.
Recovered at Mavillette, Digby Co., N. S., by Frank S. Doucet.
 December 18, 1912.
 Caught alive 'Bird seemed half tame, due probably to some ailment. Band moved easily up and down the tarsus.' F. D.
5830. GREAT BLACK-BACKED GULL. *Larus marinus.*
Banded at Lake George, Yarmouth Co., N. S., by Howard H. Cleaves.
 July 26, 1912.
 Fledgling 'a few of these birds (about three dozen were banded) were seen later from my blind. They paid no attention to the bands.' H. H. C.
Recovered at Cape Negro Is., Shelburne Co., N. S., by Ashley Smith.
 October 4, 1912.
 Shot by Mr. Smith when gunning.
5832. GREAT BLACK-BACKED GULL. *Larus marinus.*
Banded at Lake George, Yarmouth Co., N. S., by Howard H. Cleaves.
 July 27, 1912.
 Fledgling.
Recovered at Prout's Neck, Cumberland Co., Me., by G. Clifford Libby.
 December 6, 1912.
 Found dead on the beach.
7115. PIPING PLOVER. *Agialitis meloda.*
Banded at Katama, Martha's Vineyard, Mass., by Howard H. Cleaves.
 July 3, 1912.
 Three days old, one of a family of three.
Recovered at South Shore of Martha's Vineyard, Mass.
 August 2, 1912.
 Shot by a boy.
12. RED-WINGED BLACKBIRD. *Agelaius phæniceus phæniceus.*
Banded at Quonochontaug, Charleston, R. I., by Harry S. Hathaway.
 June 8, 1912.
 Fledgling, 'caught with the hands and when released alighted on a cattail.' H. S. H.
Recovered at Green Pond, Colleton Co., S. C., by Thomas Grant.
 November 2, 1912.
 Shot by a 'bird minder.' ('A small Blackbird known as the Red-winged blackbird, in the fall very destructive to rice.' D. J. Chaplin (owner of plantation).)

6261. PHOEBE. *Sayornis phæbe*.

Banded at Meriden, Sullivan Co.,
N. H., by Ernest Harold
Baynes.

June 6, 1912.

Adult, nest in old house in Corbin
Park.

Recovered at Meriden, N. H., by
Mrs. Ernest Harold Baynes.

July 14, 1912.

Found dead beneath nest; 'could
assign no cause for death. As
far as I could see the presence
of the band had had nothing to
do with the case. The bird
had laid one egg of the second
set.' E. H. B.

EXPLANATION OF PLATES.

PLATE VII.

FIG. 1. Banding young Black-backed Gulls (*Larus marinus*) in the
Lake George, Nova Scotia, Colony, July 25, 1912. Photograph by G. K.
Noble.

FIG. 2. Banded young Black-backed Gull, Lake George, Nova Scotia,
1912.

PLATE VIII.

FIG. 1. Two young Mourning Doves (*Zenaidura macroura carolinensis*)
banded at Staten Island, N. Y. City, May, 1912. Game birds or others
shot for food are most likely to produce return records.

FIG. 2. Chimney Swift (*Chatura pelagica*) banded at Meriden, N. H.,
in June, 1911, and returned, after wintering in the tropics, to his old chimney
in New Hampshire, June, 1912. Photograph by Ernest Harold Baynes.

FIG. 3. Old Barn Owl (*Aluco pratincola*) and her five young banded at
Staten Island, N. Y. City, June, 1912. Only one pair of these birds is
known to nest each year on the island and banding is likely to cast light
on the problem of dispersal of the young.

ANATOMICAL NOTES ON SOME GENERA OF PASSERINE
BIRDS.

BY HUBERT LYMAN CLARK.

THERE are many genera of Passerine birds, the relationships of which are still more or less uncertain, largely owing to our lack of knowledge of their anatomy. Thanks to the kindness of Mr. Outram Bangs, and his interest in having our knowledge along these lines extended, some alcoholic material has already been placed in my hands and more is promised, which will enable me to study the anatomy of some of these genera of doubtful affinity. Through the kindness of Dr. C. W. Richmond and the authorities of the United States National Museum, to whom I here express my hearty thanks, representatives of the three following genera have been sent me, and I venture to present here the results of my studies. Such studies can only be carried on with profit, where large collections of skins and alcoholic birds are accessible for comparison, and I am therefore indebted to Mr. Henshaw and Mr. Bangs for the freedom with which I have been permitted to use the collections in the Museum of Comparative Zoölogy.

SALTATOR.

An adult male specimen of *Saltator atriceps* Lesson, from Mexico, lacking wing and tail feathers, but otherwise in good condition, preserved in alcohol, has been carefully studied in comparison with *Pipilo* and *Piranga*. The characters of the bill and feet of *Saltator* are too well known to need any comment from me, while the tongue shows no distinctive character. It is so similar to that of *Pipilo* that the only difference is its slightly greater fleshiness.

Pterylosis. The general pterylosis of *Saltator* is like that of most oscinine birds and reveals no really distinctive feature. The upper cervical tract is long and narrow, only three feathers wide for most of its length, but the dorsal tract has the usual rhomboidal form. Other specimens show that the wing is pointed by the sixth primary, which is nearly equalled by the fifth and

seventh; the fourth is longer than the eighth which is about equal to the third; the second is longer than the ninth which may be either longer or shorter than the first. This arrangement of the primaries is quite different from that shown by *Piranga* but is almost exactly like that found in *Pipilo erythrophthalmus*. The tail is very much graduated and is made up of 12 soft, broad rectrices.

Alimentary Canal. No notable characters are shown by the intestine or stomach, which are not distinguishable from those of *Pipilo*. The intestine measures about 225 mm. in length, or rather less than the total length of the bird, but one and a half times the length of the bird, if the rectrices are not included. The stomach contained seeds and the pit of a small, cherry-like fruit, as well as much undetermined vegetable matter; no insects were noted.

Palatine Region. The palatine processes are long and conspicuous as in the finches and tanagers generally. There is a well-developed "secondary palatine process" on each side much as in *Habia*, although not so long or conspicuous as in that genus. They are rather better developed than in *Piranga*. The maxillo-palatines are not peculiar.

Sternum. There is no trace of an 'osseous bridge' from the anterior margin of the sternum to the manubrium, such as occurs in *Piranga* and *Rhodinocichla*. Back of the anterior margin which is vertically very much thickened there is a bony roof over the small space contained between the anterior margin and the sloping sides of the sternal floor. This bony roof is present in many finches and tanagers but shows great diversity in its extent and appearance. In *Saltator*, it is perforated by a conspicuous, circular, median foramen, posterior to which is a second much smaller opening. There are no openings in this bony roof in *Pipilo* but in *Habia*, there are two as in *Saltator* although they are very much smaller than in that species. In *Piranga*, there are, in the male, two very large foramina side by side and a smaller opening may be seen in the posterior face of the anterior margin; in the female, the large foramina seem to be wanting. Whether this bony roof and these foramina have any special significance I am not prepared to say, but their appearance in *Piranga* (male), *Habia* and *Saltator* is striking.

Conclusions. The resemblance of *Saltator* to *Pipilo* in its ana-

tomical features is striking, while in two details (secondary palatine process and foramen in osseous roof above sternum) in which it differs from that genus it resembles *Habia*. It lacks the 'osseous bridge' of the sternal manubrium so marked in *Piranga* and *Rhodinocichla*. It seems to me therefore that Ridgway is right in placing *Saltator* in the *Fringillidæ*.

CHLOROPHONIA.

An adult male of *Chlorophonia callophrys* (Cabanis) from Costa Rica has been at my disposal. It has been compared chiefly with *Piranga* and *Euphonia*. Unfortunately alcoholic specimens of other *Tanagridæ* have not been available, excepting *Rhodinocichla*. The characters of the bill and tongue need no comments from me but the tarsi show a certain character which does not seem to have been noted hitherto.

Tarsus. Examination of the alcoholic specimen revealed the interesting fact that the tarsi are distinctly booted. The three scales which usually cover the front of the tarsus in tanagers are fused together so that there is hardly a trace of the lines of division. On noting this fact, I examined a large number of skins of *Chlorophonia* (5 species), *Pyrrhuphonia*, and *Euphonia* (10 species) and several genera of more typical tanagers, with the result, which was surprising to me, that a booted tarsus, as perfect as that of a thrush, is by no means rare among these tanagrine birds. I find it occurs in *Pyrrhuphonia* constantly in both sexes and may well be considered one of the generic characters. It is also fairly constant in *Chlorophonia callophrys*, *longipennis*, *viridis*, *frontalis psittacina*, and *occipitalis* but is less frequent in typical *frontalis* and in *preti*. In all these cases adult males generally have the tarsus booted, but in the females as a rule, and in the young the divisions between the scutes are still to be seen. In *Euphonia affinis*, both sexes are, as a rule, booted but in most species of the genus, the scutes on the front of the tarsus are quite distinct. Booted tarsi are also found, at least in adult males of *Calospiza*, *Pœcilothraupis*, *Hemithraupis*, *Chlorospingus* and *Mitrospingus*. Very probably they will be found in other genera and their occurrence throughout the *Tanagridæ* deserves detailed investigation.

Pterylosis. The general pterylosis of *Chlorophonia* deserves comment because of the noticeable width of the tracts and the density of their feathering. This is particularly true of the upper cervical tract. The dorsal tract ('saddle') is not as broadly rhombic as in most oscines but the outer angles are rounded. The posterior end of the 'saddle' is almost completely separated from the remainder of the dorsal tract, which is at first narrow and with few feathers but becomes broad and well-feathered at the oil-gland. The sternal tracts are abruptly contracted where they pass into the ventrals. There are nine primaries and nine secondaries in the wing; the sixth, seventh and eighth primaries are nearly equal, the seventh a trifle the longest perhaps; the ninth is next, with the fifth, fourth, third, second and first in regular succession. There are twelve rectrices of approximately equal length, though the outer ones are of course (since the tail is nearly square-cut) really the longest.

Alimentary Canal. The stomach is small but quite distinct. One can distinguish a proventriculus about six mm. long and a gizzard of about the same length. The latter has thin walls but the inner surface is hard and corrugated, so there is no reason for refusing to call it a gizzard. Forbes states (P. Z. S. London, 1880, p. 145) that in *Chlorophonia viridis* there is "the same non-development of a gizzard" as in *Euphonia*. It is curious that there should be a noticeable difference on this point within the limits of a single genus, but certainly in *Chlorophonia callophrys* the gizzard is far better developed than in *Euphonia*. The intestine in *Chlorophonia* is extraordinarily long; in the specimen before me it measures 340 mm. or more than $2\frac{1}{2}$ times the total length of the bird. Naturally in its arrangement within the body cavity we find two more folds than is usual among tanagers. The stomach contains seeds and indeterminate vegetable matter and remains of at least one insect.

Palatine Region. The bony palate is remarkable for the very short palatine processes. They are as short and blunt or rounded as in many *Mniotiltidæ*, so that the palate is not at all tanagrine in appearance. There is no secondary palatine process and the maxillo-palatine bones show no peculiarities. The vomer is noticeably broad and thick, with the anterior margin not deeply notched.

Sternum. There is no trace of the osseous bridge nor of foramina

in the bony roof of the space back of the anterior margin of the sternum. In all particulars, the sternum appears to be typically fringilline.

Conclusions. The details of anatomy here given throw very little light on the affinities of *Chlorophonia* but there is no special relationship to the tanagers shown. The palatine structure and the peculiarities of the alimentary canal both tend to separate it from that group.

EUPHONIA.

An adult male of *Euphonia minuta* from Costa Rica has been available for study and comparisons have been made chiefly with *Chlorophonia*. The bill and feet need no discussion here; the character of the tarsal covering in *Euphonia* has been described above under *Chlorophonia*.

Tongue. The tongue of *Euphonia* is strikingly different from that of *Chlorophonia* or any of the tanagrine birds I have examined and resembles that of some of the *Cœrebidæ*. It is almost tubular, the sides being rolled inward but not quite meeting. The tip is brushy.

Pterylosis. The general plan of the pterylosis is not peculiar. The dorsal saddle is more nearly rhombic than in *Chlorophonia* and the other tracts are not so broad nor so densely feathered as in that genus. The arrangement of the nine primaries is essentially the same, but the eighth is slightly the longest and the ninth is a trifle longer than the sixth. There are twelve nearly equal rectrices.

Alimentary Canal. The genus *Euphonia* has long been noted for the apparent absence of a stomach. The specimen at hand does not seem to differ essentially from the one figured by Forbes (l. c.). The intestine is very long, about 180 mm., or twice the total length of the bird, and is much convoluted, as in *Chlorophonia*.

Palatine Region. The palate of *Euphonia* has been figured by Parker (Trans. Zool. Soc. London, vol. 10, pl. 46, fig. 3) and the specimen before me agrees well with that figure except for the apparent absence of maxillo-palatines. Parker indicates these bones rather indefinitely and I have found nothing that seems to

me to correspond with them. The palatine processes are remarkably long and pointed, a very characteristic feature of the skull and strikingly different from the condition found in *Chlorophonia*. The vomer is deeply divided anteriorly as Parker has shown and thus is quite different from that of *Chlorophonia*.

Sternum. The sternum shows none of the tanagrine peculiarities of *Piranga* but is almost exactly similar to that of *Chlorophonia*.

Conclusions. The differences between *Euphonia* and *Chlorophonia* in the tongue and palate are so marked as to make one hesitate before asserting that the two genera are nearly allied. Differences in the alimentary canal and in the feet also, may not be ignored. In all of these features *Euphonia* approaches some of the *Cœrebidæ* and the possibility of its relationship to some members of that family should not be ignored. It is however possible that *Euphonia minuta* is not representative of the genus and that some other species may show more tanagrine affinities.

GENERAL NOTES.

Holboell's Grebe in Concord, Mass.—On December 15, 1912, Bate-man's Pond froze over with black ice, but a thaw and rain resulted on the 17th in covering the ice with nearly an inch of water. During the moon-light night that followed a Holboell's Grebe (*Colymbus holboëlli*) attempted to light in the pond and I believe settling on the ice and was unable again to take wing. On the following morning, it having turned cold during the night, the bird was found with its breast feathers frozen in the ice. The wrists of its wings were badly lacerated by beating against the ice to free itself, but in other respects the bird was uninjured. After much piteous squawking, its feathers were cut from the ice and the bird liberated. Its wings, however, were injured so badly that it was killed and is now preserved in this Museum.—R. HEBER HOWE, Jr., *Thoreau Museum, Concord, Mass.*

Additional Notes on the Harlequin Duck in Wyoming.—In 'The Auk' for January, 1913, pp. 106-107, I recorded two male specimens of the Harlequin Duck which I saw at Teton Lodge (Moran Post Office), in Jackson Hole last September, and which were supposed to have been

killed in May, 1908. Efforts were made at the time to obtain further details in regard to the capture of the specimens but without success. Since the appearance of the note a letter has been received from Mr. B. D. Sheffield, of Moran, Wyoming, the owner of the birds, who states that they were killed on April 20, 1907. He adds that there were but two of these ducks which appeared during the latter part of March and were seen every day as they stayed on Snake River in front of the Lodge just below the outlet of Jackson Lake. He has never seen any since. In view of the rarity of the Harlequin Duck in this part of its range, it seems desirable to correct the supposed date and to place on record the exact date of capture.—T. S. PALMER, *Washington, D. C.*

White Ibis (*Guara alba*) in Missouri.—On July 10, 1910, two White Ibises were killed at Old Monroe, Mo., a town in Lincoln County, fifty-two miles north of St. Louis, by a well known St. Louis banker. The two birds taken were in adult plumage out of a flock of about one hundred. The birds were mounted by Mr. J. Kirk Keller, a St. Louis taxidermist, and one of the specimens now adorns the "Old Monroe Club."

This I believe is the first record of the White Ibis in Missouri. Mr. Otto Widmann, in his book 'A Preliminary Catalog of the Birds of Missouri,' states that two specimens in immature plumage were killed near Quincy, Ill., but gives no instance of the bird being identified in Missouri.—H. C. WILLIAMS, *St. Louis, Mo.*

Glossy Ibis (*Plegadis autumnalis*) in Eastern Cuba; a New Record.—On January 25, 1913, I took an adult male of *Plegadis autumnalis* (Linn.) in winter plumage in the lagoon at 'Manati' on Guantanamo Bay, Oriente Province, Cuba. There were a pair of this Ibis feeding together with Little Blue, Louisiana, and Great Blue Herons, on small fish, in a nearly dry puddle of the lagoon.

This is the first record for Eastern Cuba for this species; the only other records for Cuba are those of Dr. Gundlach from 'La Cienaga de Zapata' and a lagoon (unnamed) near Cardenas, in Matanzas Province.

I had seen a specimen some five years ago flying over the bay near 'Manati,' but was unable to secure it; since then none have been seen till this year.—CHAS. T. RAMSDEN, *Guantanamo, Cuba.*

Bittern Breeding in New Jersey.—To the few breeding records of the Bittern (*Botaurus lentiginosus*) in New Jersey, I desire to add two more. A set of four far incubated eggs is now in my collection, taken near the coast in Atlantic County on June 11, 1911, and on June 29, 1912, I examined a nest of this bird containing four full fledged young. It was placed flat on the ground, poorly concealed and was built of a mass of reeds and sedges.—RICHARD C. HARLOW, *State College, Penna.*

Nesting of the Black Rail (*Creciscus jamaicensis*) in New Jersey.—

The Black Rail has been recorded as nesting in southern New Jersey in 1810, 1877 and 1886, and judging from these data and the secretive habits of the bird, it always seemed to me probable that it bred regularly in suitable localities where original conditions had not been altered. Inquiries among friends who do considerable gunning along the coast between Cape May and Asbury Park brought forth the fact that at least two of them had shot Black Rail in the fall, and one told me that he had seen young birds at rare intervals on the salt meadows.

I requested him to make a special search for the bird during the breeding season of 1912, and on June 22 I was rewarded with a letter, announcing the discovery of a nest containing seven eggs on the edge of the marshes back of Brigantine, which he had collected for me on June 20. On the 29th I visited the nest from which the set had been taken. It was built in a low marshy meadow, overgrown with salt grass and sedge and very skilfully concealed in a thick mass of mixed green and dead grass, so that it was completely hidden from above. In composition, it was better built and deeper cupped than the nests of the Virginia, Sora, King and Clapper Rails that I have seen. In size the nest was little larger than the average structure of the Robin, but deeper-cupped and built entirely of the dry, yellowish stalks of the sedges, and there in the lining, clung several black feathers. Thinking that there might be other nests in the vicinity we began searching every thick clump of marsh grass that we saw, and presently came upon another also containing seven eggs. It was placed among thick clumps of marsh grass and was quite invisible until the grass was parted from above. It was an inch above the salt meadow and was interwoven on all sides with the surrounding stalks. We tried hard to flush the birds but without success, although I once heard a prolonged call or succession of short quick notes, 'kie, kie, kie, kie, kie.' The first set of eggs was partly incubated while the second was fresh. It is possible both were laid by the same pair of birds. The eggs show great similarity and in each set one is peculiar being discolored with a yellowish stain. This points to their being laid by the same bird but the short space of time, nine days, seems too short a period for the building of a new nest and the laying of seven eggs.

The ground color of the eggs is creamy white, well sprinkled with fine dots of reddish brown and a few larger spots. The speckling is nearly like that seen in certain types of eggs of the Meadowlark, but the ground color is entirely different. In size they are noticeably smaller and less pointed than any of our other Rails' eggs, averaging 1.02 by .78 ins.—RICHARD C. HARLOW, *State College, Penna.*

A Recent Capture of the Eskimo Curlew.—I wish to place on record the capture of an Eskimo Curlew (*Numenius borealis*), taken at Fox Lake, Dodge county, Wisconsin, ten miles northwest of my home, on September 10, 1912. Sex, male, adult, fat and in good plumage. Number 7660, collection of W. E. Snyder.

I was away from home for the day, following a threshing crew. The day had been a hot one, and returning to my home about 9 o'clock my wife greeted me thus: "I've got a rare bird for you now I know." Unwrapping the bird the reader can imagine my feelings when I saw the prize. It had been left for me by a party who has repeatedly refused to give me any information as to who shot it, fearing to do so because it had been killed out of season — nor can I learn anything as to whether the bird was alone, flying over decoys, on lake shore, or anything further than that it was shot at Fox Lake. Being about worn out by the hard and hot day's work I could not muster enough courage to mount the bird, so hurriedly I skinned it and that night drove to town and left the skin, duly packed for shipment, with a friend, with orders to mail it on the early morning train, to my friend, the skilled Chicago taxidermist, Mr. Karl W. Kahmann, who has done an artist's job on the bird.

I have carefully compared the bird with descriptions of the species as given in the works of Coues, Ridgway and many other ornithologists. The culmen measures 2.50 inches, wing 9 inches, tarsus 2.62, neck and breast marked evenly and densely with dusky streaks, primaries uniform dusky.— W. E. SNYDER, *Beaver Dam, Wis.*

Hudsonian Curlew on Long Island in Winter.— On the evening of December 24, 1912, during a heavy snow and wind storm, a Hudsonian Curlew (*Numenius hudsonicus*) was found in an exhausted condition in the backyard of an apartment house at Rockaway Beach, Long Island. After spending the night in a basket it recovered sufficiently to fly away at seven-thirty o'clock the following morning. The owner of the house who discovered the bird would not allow it to be taken but it was identified beyond question.

I have not been able to find any previous record of the occurrence of *Numenius hudsonicus* at this time of the year on Long Island.— CHARLOTTE BOGARDUS, *Coxsackie, New York.*

A Peculiar Hudsonian Curlew.— I had supposed that a Curlew with a bill less than 3 inches in length might safely be put down as an Eskimo, but it seems that this is not the case. A bird was shot at Northeast Harbor, Me., September 5, 1912, by Mr. Lynford Biddle of Philadelphia, which was supposed by several persons who saw it in the taxidermist's shop to be an Eskimo Curlew. Upon writing to Mr. Biddle for information he very kindly presented the specimen to the Academy of Natural Sciences of Philadelphia. It proved, as he himself had determined it, to be a Hudsonian Curlew (*Numenius hudsonicus*) but with the bill, which appeared perfectly normal in other respects, only 2.25 inches in length. This is three quarters of an inch shorter than the minimum given in Ridgway's 'Manual,' and exactly equals the minimum for the Eskimo Curlew. This incident emphasizes the importance of making a careful ex-

amination of supposed Eskimo Curlews and not depending too much upon bill measurements.—WITMER STONE, *Academy of Natural Sciences, Philadelphia*.

Hudsonian Godwit on the Magdalen Islands.—The Hudsonian Godwit (*Limosa hemastica*) is becoming so rare that every occurrence is worth publishing, particularly as it seems to be following the Eskimo Curlew into oblivion.

On the 18th of February, 1911, a hunter got after a flock of six birds, presumably all of the same species, and of these he secured four. Three of these were eaten but the fourth was mailed to me by my friend Mr. J. B. Boutilier with the above information. It was a new bird to him and was also new to my collection.

The specimen is now No. 2570 in my cabinet.—W. E. SAUNDERS, *London, Ont.*

The Golden Plover (*Charadrius dominicus dominicus*) Again on the Coast of South Carolina.—In 'The Auk,' Vol. XXIX, 1912, p. 101, I recorded a specimen of this bird taken by me on November 4, 1911. I now wish to announce the capture by the writer of two birds taken on November 27, 1912, on Oakland plantation, Christ Church Parish.

According to Prof. Wells W. Cooke (Distribution and Migration of North American Shore Birds, Bull. No. 35, Biological Survey, 1910) this date of capture is the latest for the United States. Since I obtained the first specimen in December, 1880 (Birds of South Carolina, 1910, p. 59) only four more have been seen, three of which I secured.—ARTHUR T. WAYNE, *Mount Pleasant, S. C.*

On the Occurrence of *Columba squamosa* (Bonnaterre) in Cuba.—During the first days of December, 1912, I was advised by a native that there was good 'Torcaza' shooting on the 'Sierra del Maquey' Range five miles to the east of the 'San Carlos' Sugar Estate near Guantanamo. I was unable to get away till the 10th, by which time the natives had had a good ten days' start, having shot probably an average of 300 pigeons a day. Still I found plenty of pigeons, *Columba squamosa* (Bonn.), and got 69 specimens in a few hours, unfortunately very few were worth keeping as great quantities of feathers were knocked off by the branches while falling. In fact only one specimen turned out really good. The pigeons, were feeding on the berries of 'Come-Cara' and 'Juan Perez'. By keeping still I could hear the berries dropping through the leaves to the ground when they slipped from the pigeon's bill, as also their soft, low 'cooing,' thus indicating where to find them.

During their stay on the 'Sierra del Maquey'—some three weeks—I can safely say that over 5000 pigeons were shot by natives for eating and selling. The custom is to cut out the breasts, fry them slightly and put them away packed in lard in earthenware vessels when they will 'keep'

indefinitely, or if the cash is needed, as it often is, the pigeons are strung through the nostrils with wire to be peddled about the streets, this latter was done last December to such a degree that the butchers of Guantnamo complained that the consumption of beef decreased.

This pigeon has the habit of moving about the country in search of food, which when once found they will not abandon for any amount of shooting so long as the supply of food lasts. During May of each year they congregate in huge numbers at certain places on the coast, where they nest on the Mangroves in colonies known as 'Pueblos'; and where unfortunately they are shot by the thousand, very often before the young are able to take care of themselves, and therefore must perish. Fortunately some of their nesting colonies are in inaccessible swamps, where they are safe, for the present at least.—CHAS. T. RAMSDEN, *Guantanamo, Cuba*.

The Marsh Hawk Nesting in New Jersey.— During the past twenty years, the impression seems to have steadily increased that the Marsh Hawk (*Circus hudsonius*) is a rare breeder in the state of New Jersey. This is not in accordance with my experience. It is true, that not many nests have been found, but during a number of trips taken to various points in Cape May, Atlantic, Burlington and Ocean Counties during the last five years I have always noted this bird as present during the breeding season. It is never as common in one place as such birds as the Fish Crow or Green Heron, but not many hawks are. On the 29th of June, 1912, I examined a Marsh Hawk's nest with five young and saw another pair of birds undoubtedly nesting, not far from Atlantic City.—RICHARD C. HARLOW, *State College, Penna.*

The Sharp-shinned Hawk again in Maine in Winter.— I saw a Sharp-shinned Hawk (*Accipiter velox*), apparently a male, circling at a height of about seventy-five yards over upper Spring Street, Portland, on the morning of January 27, 1913. The bird has thus been five times recorded¹ as a winter visitor in Maine after relatively little observation.—NATHAN CLIFFORD BROWN, *Portland, Maine*.

First Michigan Specimen of the Three-toed Woodpecker.— While enroute to the northern peninsula on the Shires Expedition to the Whitefish Point Region, Michigan, the writer examined a collection of mounted birds in the high school at Sault Ste. Marie. In this collection there is a specimen of *Picoides americanus americanus* labeled "Soo, October 1, 1910; C. E. Richmond, collector. Although Mr. Richmond has not been located, Mr. M. J. Walsh, Superintendent of Schools, Sault Ste. Marie, states that Mr. Richmond was at that time instructor in biology in the high school, and that there can be no reasonable doubt of the correctness of the locality record.

¹ Auk, XXVIII, p. 265.

This is apparently the only Michigan specimen of this species that has been preserved. It should be pointed out that at Sault Ste. Marie the northern peninsula is only separated from Canada by the width of the Saint Mary's River, so that northern forms may enter our limits most easily at this place.—NORMAN A. WOOD, *Museum of Natural History, University of Michigan*.

Arkansas Kingbird (*Tyrannus verticalis*) in Delaware.—On December 31, 1912, while on a collecting trip with Mr. Charles J. Pennock at Rehoboth, Delaware, we fell in with four individuals of this species, two of which were secured. The birds were apparently engaged in catching some kind of small insect near the ground over an old corn field, darting down from the tops of the stripped stalks and returning to the same perch in the regular Kingbird manner. They were rather wild and difficult to approach. On examination the stomach was found to contain numerous fragments of some small beetle-like insect. The specimens secured were an immature male and female. The occurrence of this species so far to the east of its normal range is further attested by the specimen captured by Mr. F. H. Kennard on October 20, 1912, at Monomoy Island, Chatham, Mass., "just off the heel of Cape Cod" (*The Auk*, Vol. XXX, Jan. 1913, p. 112). All of these individuals were thus close to the sea, our birds being just back of the beach, with a strip of salt marsh and narrow tangle of green-brier intervening.

It seems reasonable to believe that these were all birds that had bred or been raised in the northern portion of the species' range, possibly somewhere in the Saskatchewan region, and that they went adrift in some westerly gale far to the southeast of their regular track at the outset of the fall migration, reaching the coast of New England and moving to the southward along the shore, lingering, without doubt, on the prairie-like stretches of the Coastal Plain in Long Island and New Jersey.—SPENCER TROTTER, *Swarthmore College, Penna.*

The Wood Pewee as a Foster Parent.—The past season a pair of Kingbirds reared a brood of young in a burr oak standing near my parlor window. In my yard all summer long a lone Wood Pewee took up its headquarters. This latter bird, so far as I could learn, was not breeding—at least there was no nest within a half mile of the house. Early in July we had a severe wind and electrical storm. A few days later I failed to find the parent Kingbirds, though three young, just from nest were about the yard, very noisy all the while. On July 20, when within 100 feet of them, I saw a lone Wood Pewee feeding these young Kingbirds—and was an interested spectator of the act for a full half hour—and the same thing was observed daily for about ten days, when the Kingbirds left for other quarters.—W. E. SNYDER, *Beaver Dam, Wis.*

Two Flycatchers of the Genus *Empidonax* New to the Fauna of South Carolina.—Since my 'Birds of South Carolina' was published in

1910, I have identified two Flycatcher's near Mount Pleasant which I wish to place on record. On October 8, 1912, a young female Yellow-bellied Flycatcher (*Empidonax flaviventris*) was taken in a large deciduous swamp, which is the first specimen I have ever seen or taken during the past 30 years of almost uninterrupted observations. When first seen I, of course, supposed the bird to be an example of the Green-crested Flycatcher (*E. virescens*) and, as it was 16 days later than I had ever detected the latter species, I concluded to obtain it. Upon securing the specimen I realized at once that I had a prize and thoroughly explored the entire swamp with the hope of finding others. But in this quest I was disappointed, as no Flycatcher of this genus was seen after that date.

In 'Birds of South Carolina' I listed the Alder Flycatcher (*E. t. alnorum*) as the form which occurs here in late summer and autumn. Upon looking over some of these Flycatcher's, which I had packed away ever since 1900, I came across a very brownish bird that I secured on September 14, 1900. In comparing it with an example of *E. trailli trailli* from British Columbia, kindly loaned to me by Dr. Louis B. Bishop, I found no difference between them, while all the other specimens I have are apparently true *alnorum* for they agree with birds from North Dakota sent to me by Dr. Bishop.

This specimen of *Empidonax trailli trailli* evidently migrated from Ohio or Illinois.—ARTHUR T. WAYNE, Mount Pleasant, S. C.

A Baltimore Oriole in Winter.—On January 15, 1913, I observed a male Baltimore Oriole (*Icterus galbula*) in first year plumage, at the home of H. D. Rymer, a farmer living near Columbiana, Ohio.

The Oriole first appeared a few days before Christmas and has been feeding there regularly ever since. While I was observing him, he went from the suet to an orchard where he was eating apples that remained on the trees. Mr. Rymer informs me that when he first appeared his feathers were ruffled, and he did not seem to be in nearly as good condition as at the present time. I am inclined to think the bird was disabled at migration time and could not leave for its usual winter home with the other migrants. I judge this from the fact that the left wing appeared to be about an inch lower than the right when the bird was perching with the wings folded to his body.—GEO. L. FORDYCE, Youngstown, Ohio.

Starlings and Turkey Vultures Migrating.—On January 3, 1912, the weather became bitter cold—following an open winter to that date, and January 4 found a flock of Starlings in Warwick Co., Va., January 6, there was a heavy snow for this section, and on the 8th a large flock was seen again in Warwick Co., while birds were killed by local gunners in Elizabeth City and Norfolk Counties. Cold weather continued until January 24 when a bright warm day induced a big flight of Turkey Vultures to recross James River at a point opposite my house—their numbers being in the hundreds. The night of March 5 it snowed again, and on the 6th a small

flock of Starlings was noticed. From that time until the present writing I have seen no Starlings in this section. During the cold spell they were also taken near Richmond, Va.—HAROLD H. BAILEY, *Newport News, Virginia*.

The Evening Grosbeak in Wisconsin.—On October 21, 1912, my mother, entering her poultry yard to feed her flock, found an adult female Evening Grosbeak (*Hesperiphona vespertina vespertina*) lying dead on the ground. On skinning the bird for my collection I found it to be in good condition of flesh, with a few moult feathers on head and neck, but could find no trace of any injury sustained, nor discover any clew whatever as to the cause of its death. I had previously seen none others here this season, and at the present date, December 16, it is my only record for 1912.—W. E. SNYDER, *Beaver Dam, Wis.*

The Snow Bunting (*Plectrophenax nivalis nivalis*) in Chicago and Vicinity during the Fall and Winter of 1912.—On account of the irregular occurrence of this bird so far south, the following records, showing its status in Chicago and vicinity, as I have observed it during the fall and winter of 1912, may be of interest. It is the more interesting because 'Bird-Lore's' Christmas census for 1912 (Bird-Lore 15:20-45. 1913) seems to indicate an absence of boreal species in the Middle States, the Snow Bunting not being recorded outside of Canada, except in the eastern states of Vermont, Massachusetts and New York.

October 23 one was seen about the beach at Jackson Park. This bird arrived three days earlier than any previously reported from this region (W. W. Cooke, 'The Migration of North American Sparrows.' Bird-Lore 15:17. 1913). October 24 there were two in the same locality. November 2 twelve were seen feeding on grass seed on the beach at Lincoln Park. November 30 two were seen flying along the beach at Miller, Indiana. December 20, ten were seen about the rocks forming the breakwater where land was being filled in at Lincoln Park. Frequent excursions after December 20 failed to reveal any more of the birds, and they probably migrated still farther south.

All the birds observed were tame, allowing a close approach, thus making their identification a very easy matter.—EDWIN D. HULL, *Chicago, Illinois*.

A Strange Sparrow Roost.—Early in the fall of 1912 the European Sparrows in the City of Utica, N. Y., established a roost in the tops of the elms in the yard of a church in the most busy part of the City. At dusk every evening they assembled to the number of several hundred to spend the night in these unprotected trees. Early in January, Mr. James O. Roberts, a young observer called my attention to the fact that there were some strange birds among the sparrows, and after some difficulty in identification it was discovered that they consisted of a Starling (*Sturnus*

vulgaris) — a new record for central New York — and a number of Cowbirds (*Molothrus ater ater*); as many as ten being seen at one time. These are strange birds for mid winter in this locality. The winter had been very mild up to this date and there was very little snow at the time.— EGBERT BAGG, *Utica, N. Y.*

Towhee in Winter near Steubenville, Ohio.— While taking an all day walk on December 26 I was surprised to find a flock of from fifteen to twenty Towhees (*Pipilo erythrophthalmus*). There were both males and females in the flock. There were several inches of snow on the ground with the thermometer at about 60° F., and a strong sun. As this is a late date for this species I thought it worth reporting. The birds were seen three or four miles south of this city on the West Virginia shore.— KENTON ROPER, *Steubenville, Ohio.*

Barn Swallow in South Carolina in Winter.— The Barn Swallow (*Hirundo erythrogastrer*) is an abundant migrant in the coast region of South Carolina, occurring regularly through the middle of October. Mr. Arthur T. Wayne (*Birds of South Carolina*, p. 139) says, "a belated specimen was observed on Oct. 29, 1906." On Dec. 17, 1912, while passing through the Navy Yard at Charleston, S. C., I had a glimpse of a Swallow which I recognized at once as belonging to this species. Hoping to get a closer view, I waited. The bird soon reappeared and passed low over my head several times, showing distinctly its color and its deeply forked tail. The correctness of the identification is, therefore, beyond question. As the use of firearms is prohibited within the limits of the Navy Yard, I was not prepared to secure the specimen.— FRANCIS M. WESTON, JR., *Charleston, S. C.*

Notes on the Loggerhead Shrike at Barachias, Montgomery Co., Ala.— On Jan. 10, 1912, the men felled a tree in the grove and in sawing it into three foot lengths turned out quite a number of large, white, blue-bellied grubs. Most of these were placed upon one of the 'cuts' but a few were left upon the ground and soon attracted the attention of a Shrike (*Lanius ludovicianus ludovicianus*). I seated myself beside the stump only six feet from the grubs on the ground, but the Shrike came and fearlessly removed them, one by one, paying little attention to my presence, so I decided to try a photograph. Securing my camera I focused it at six feet upon the grubs on one of the 'cuts,' while I sat upon another, but soon I had worked the instrument up within eighteen inches of them and still the Shrike came with very little hesitation and removed the very last one, regardless of the click of the shutter, while I still sat there. The grubs were impaled upon the thorns of several different trees. After hastily snatching one the Shrike nearly always alighted upon some nearby branch to get a firmer grip upon the grub before flying away to impale it.

Jan. 16, 1912, everything was frozen hard and the bright sun did not

seem to relieve matters. I was returning from a visit to a trap in the grove when my attention was attracted by the cries of a bird in the broom sedge near me. Advancing cautiously I discovered a Shrike throttling a Mockingbird which it had pinned down on its back on the ground. I watched until the Mockingbird was killed and then noticed another hovering about with drooping wings, but it made no attempt to drive the Shrike away. I picked up the dead bird then and found that its neck was broken and a large patch of skin missing from its occiput. Evidently it was killed by its neck being broken, which the Shrike accomplished by repeated blows with its hooked beak. I squatted perfectly still and held the dead bird in my right hand, which was gloved, and the Shrike came and endeavored to take it from me, alighting on it and tugging at its head with all its might. Putting the bird down I returned to the house for my camera but when I got back I found the Mockingbird disemboweled and the Shrike nowhere in sight. The entrails were removed through a small hole in the bird's back, about over the kidneys. The measurements of the dead Mockingbird exceeded those given in Coues' 'Key' for the Shrike, although I judge that it was a young one. It is my opinion that the Shrike attacked such a large bird only under stress of hunger, everything being frozen. I am almost sure that this is the same bird I photographed Jan. 10.—ERNEST G. HOLT, *Barachias, Ala.*

Wintering of the Blue-headed Vireo (*Lanivireo solitarius solitarius*) at Aiken, South Carolina.—On January 28, 1913, I saw a Blue-headed Vireo (*Lanivireo solitarius solitarius*). The bird was flitting about in the branches of a long-needled pine (*Pinus palustris*) in company with two Brown-headed Nuthatches, two Brown Creepers, and a Golden-crowned Kinglet. The bird was tame, allowing me to approach within a few feet before paying any attention to me.

As this species is not credited with wintering as far north as this point, I consider it a note worth recording.—JOHN DRYDEN KUSER, *Bernardsville, New Jersey.*

The Magnolia Warbler (*Dendroica magnolia*): an Addition to the Fauna of the Coast Region of South Carolina.—On September 29, 1912, I shot on Oakland plantation, Christ Church Parish, a superb young male of this species. There was a tremendous migration that morning and, although Sunday, I thought I would take a short walk and see if there were any *rarae aves* among the thousands of Warbler's which had arrived. When first seen I was satisfied that the bird was a young male Cape May Warbler (*Dendroica tigrina*), as the morning was dark without sunlight, and it was not until I had the bird in my hand that I realized I had made a mistake and had taken a bird that I had never seen before. One shot was fired, but it brought to me a new bird for the coast of South Carolina.

Dr. Eugene Edmund Murphy has taken this species in the autumn at Augusta, Georgia, but he has found it excessively rare there.—ARTHUR T. WAYNE, *Mount Pleasant, S. C.*

The Cape May Warbler (*Dendroica tigrina*) Taken in the Spring on the Coast of South Carolina.—Dr. Louis B. Bishop, while paying me a visit in the spring of 1912, shot two Cape May Warblers—a male and a female—on April 23, 1912, and, on the same day and at the same place, I took three of these birds. The Cape May Warbler has not been seen or taken in the spring by the writer in the past thirty years and he is indebted to Dr. Bishop, who took the first specimen, for finding the birds.—ARTHUR T. WAYNE, *Mount Pleasant, S. C.*

Catbird and Brown Thrasher in Winter in Massachusetts.—On Christmas Day, 1911, in the Arnold Arboretum at Jamaica Plain, Massachusetts, I saw a Catbird (*Dumetella carolinensis*) in some shrubbery about three hundred yards from the museum. It was quite lively though silent and rather shy. Twenty days later, on January 14, 1912, I again saw what was probably the same bird. This time it was apparently sunning itself in the vines on the museum. After allowing a rather near approach it flew across the road into some bushes, where it remained still seeking the sunshine and as before, silent. The weather was clear and cold with a minimum temperature of one degree below zero and the Catbird acted, as it well might, as if it was half frozen. The bird was not observed after this date and as shortly afterwards some Catbird feathers were seen strewn around about the museum it probably came to an untimely end.

While walking in the Arboretum on the morning of December 22, 1912, I saw a Brown Thrasher (*Toxostoma rufum*) on the ground very busily at work poking among the leaves with its bill. The bird was very tame and I approached to within four feet of it, hardly any notice being taken of me. It did not utter a note of any kind neither did it leave the ground while I was there. It has not been seen since, the snowstorm of Christmas Eve probably driving it southward.—HAROLD L. BARRETT, *Jamaica Plain, Mass.*

Brown Thrasher Wintering near St. Louis, Mo.—The winter of 1912-13 has been remarkably mild with very little precipitation. The ground has not been completely covered with snow this winter in the brush-covered portions of the bottomlands, and the lowest temperature was four above zero, on February 1.

On Feb. 2, 1913, at Creve Coeur Lake, in a well sheltered area of thick underbrush in the Missouri River bottomlands fourteen miles north of St. Louis, I had the good fortune to observe at close range a Brown Thrasher (*Toxostoma rufum*). It was the day after our coldest weather and a light snow was falling. The bird was scratching in the dead leaves in search of food and from all appearances was in excellent condition. It flew from bush to bush as I pursued it and seemed very much at home in its surroundings. Mr. Widmann gives no record of the bird wintering near St. Louis and gives March 13, 1882, as the earliest date of spring arrival.—H. C. WILLIAMS, *St. Louis, Mo.*

Random Notes from Easton, Pa.—*Ceryle alcyon alcyon*. BELTED KINGFISHER.—I saw a Kingfisher flying along Bushkill Creek calling lustily on January 4, 1911.

Colaptes auratus luteus. NORTHERN FLICKER.—One was seen on February 13, 1909. This is the first and only winter record I have for the species.

Archilochus colubris. RUBY-THROATED HUMMINGBIRD.—A female or a bird of the year was seen in an orchard here on October 3, 1908. The Hummingbird usually leaves more than a week earlier.

Loxia curvirostra minor. CROSSBILL.—On April 13, 1912, I saw two Crossbills in a small maple tree, apparently feeding on the buds. They were quite fearless; so I was able to approach very near to them.

Spizella pusilla pusilla. FIELD SPARROW.—On November 27, 1908, two Field Sparrows were seen in a tangled briar thicket. Another one was observed on January 9, 1909.

Compsothlypis americana usneæ. NORTHERN PARULA WARBLER.—In 1907 I saw this warbler on October 17; while in the following year one was seen on October 10. These are late dates.

Dendroica virens. BLACK-THROATED GREEN WARBLER.—An immature bird was seen as late as October 31, 1907.

Setophaga ruticilla. REDSTART.—Either a female or an immature bird was observed along the edge of a woods on October 27, 1909. This species breeds here occasionally. On June 8, 1907, an occupied nest was discovered above twenty feet above the ground in an upright crotch of a vine, pendant on a tree. At the time the female was on the nest.

Sitta canadensis. RED-BREASTED NUTHATCH.—This bird is a very erratic visitant here. During the fall of 1906 it was very abundant from September 25 until October 30, when the last one was noted. In 1907 but one individual was observed. Then the species disappeared from here and for three years none was seen. But on October 11, 1911, a solitary bird was noted; while on October 17 and 18, 1912, several were observed.

Regulus calendula calendula. RUBY-CROWNED KINGLET.—On February 27, 1911, a male Ruby-crowned Kinglet was seen and positively identified. The bird was flitting about in the undergrowth of a woods giving its wren-like call. This is not the first winter record for this locality, for during January and March, 1908, this species was observed several times. (Cassinia, 1908, p. 64.)

Hylocichla guttata pallasii. HERMIT THRUSH.—Again I wish to report the presence of this species here in winter (Auk, Vol. XXIX, p. 250). On December 25, 1912, I saw an individual of the species in the undergrowth of a woods on a sunny hillside. The bird was watched some time and closely observed. Its call, habit of nervously jerking the tail up and down with an accompanying flap of the wings, and the coloration, which was characteristic of the Hermit Thrush, left no doubt as to the true identity of the bird.—EDWARD J. F. MARX, *Easton, Pa.*

A few South Dakota Records of some Western Birds.—A short time ago I went over the bird skins in the museum here and sent a number which promised to be of interest to the Biological Survey for identification by H. C. Oberholser. In a letter recently received from Wells W. Cooke he states that, among others, the following records are extensions of previously established ranges. It is therefore thought that the publication of the known data concerning these records would be desirable. The Grebe was collected by H. E. Lee of Rapid City, the Savannah, Grasshopper and Tree Sparrows by E. H. Sweet of Sturgis and the remaining numbers by the writer.

***Æchmophorus occidentalis*.** WESTERN GREBE.—Hamlin County, northeastern S. D., Nov. 10, 1911, immature. (Mr. Lee states that he has found nests of this species and seen young in all stages upon Lake Norden in that county.)

***Otus asio maxwelliae*.** ROCKY MOUNTAIN SCREECH OWL.—Oelrichs, Fall River County, southwestern S. D., Aug. 5, 1911. Considered by Cooke to be a notable extension of range.

***Dryobates pubescens homorus*.** BATCHELDER'S WOODPECKER.—Willet, Harding County, northwestern S. D., Sept. 4, 1912,

***Myiochanes richardsoni*.** WESTERN WOOD PEWEE.—Fall River County July 27, 1911, Lawrence County, northern Black Hills, July 25, Harding County, Sept. 4, 1912. (Abundant in the pine forested areas of western S. D.)

***Cyanocephalus cyanocephalus*.** PINYON JAY.—Buffalo Gap, Fall River County, July 24, 1911. (Quite frequent in the coniferous regions especially the Black Hills, Cabe Hills and Pine Ridge.)

***Poecetes gramineus confinis*.** WESTERN VESPER SPARROW.—Forestburg, Sanborn County, southeast-central S. D. July 15, 1906.

***Passerculus sandwichensis alaudinus*.** WESTERN SAVANNAH SPARROW.—Menno, Hutchinson County, southeast-central S. D., Apr. 28, 1902.

***Ammodramus bairdi*.** BAIRD'S SPARROW.—Harding County, July 12, 1910, Sept. 3, 1912. (Breeds quite abundantly in the extreme northwestern corner of the state.)

***Ammodramus savannarum bimaculatus*.** WESTERN GRASSHOPPER SPARROW.—Menno, Hutchinson County, Aug. 15, 1900.

***Spizella monticola ochracea*.** WESTERN TREE SPARROW.—Hutchinson County, Dec. 27, 1900.

***Spizella passerina arizonæ*.** WESTERN CHIPPING SPARROW.—Oelrichs, Fall River County, Aug. 4, 1911.

***Guiraca caerulea lazula*.** WESTERN BLUE GROSBEAK.—Carter, Tripp County, south-central S. D., Aug. 16, 1911, immature. Breeds frequently in the Pine Ridge country as far east as the 100° of longitude.

***Myadestes townsendi*.** TOWNSEND'S SOLITAIRE.—Minnekahta, Fall River County, July 27, 1911, a fledgling. Breeds regularly and plentifully in all sections of the Black Hills. A straggler noted at Vermilion, extreme southeastern S. D., Jan. 9, 1911, (see 'The Auk', April, 1911, p. 270.) —S. S. VISHER, *State University, Vermilion, S. D.*

Additions to a list of the Birds of Harding County, Northwestern South Dakota, II.— In 'The Auk' for January, 1911, pages 5-16, I gave a partial list of the birds of this county. In 'The Auk' for January, 1912, page 110-111, was a first list (10 species) of additions. During the summer of 1912 I revisited in August and September, practically all parts of the county under the auspices of the South Dakota State Survey and collected a number of birds. Species added to the list at this time are marked by an asterisk.

Ardea herodias. GREAT BLUE HERON.— Though reported by Grinnell and by Catron, I met with no individuals during 1910 or 1911. In 1912, however, several were seen along the Little Missouri River early in September.

Dryobates pubescens homorus. BATCHELDER'S WOODPECKER.— A specimen collected September 4, was identified by Oberholser as belonging to the Rocky Mountain subspecies. In my list the Downy Woodpeckers were reported as *D. p. medianus*.

***Porzana carolina.** SORA.— One individual was seen September 7, in a small reed-filled slump-marsh in the East Short Pines.

Ammodramus bairdi. BAIRD'S SPARROW.— This was an abundant species early in September. Specimens collected at that time as well as the breeding male shot July 14, 1912, have been identified by Oberholser.

Melospiza melodia juddi. DAKOTA SONG SPARROW.— A breeding Song Sparrow collected by me in the sand hills of southern South Dakota (Bennet County) has been referred by Oberholser to this subspecies. Cooke writes as though all the Song Sparrows of western South Dakota must therefore belong to *M. m. juddi* (instead of *M. m. melodia* as I reported in my list.)

***Melospiza lincolni lincolni.** LINCOLN'S SPARROW.— One collected September 7, in the East Short Pine Hills (identified by Biological Survey.)

Representatives of various other species were collected and specimens of a number were submitted to the Biological Survey, but since they merely substantiate earlier field identifications, and require no corrections it is not thought necessary to mention them.— S. S. VISHNER, *University of South Dakota, Vermilion, S. Dak.*

Birds at Sea.— On December 8, 1912, a live female Eider Duck (*Somateria dresseri*) was brought to me. It had been captured on the deck of the steamship 'Juniata,' off Cape Cod, Mass., December 5, having come aboard in a dense fog. It lived for ten days on celery tops— all other food refused— at the end of which time it died, and is now in my collection.

On about October 16, 1911, two young Duck Hawks were captured on a tramp steamer coming to this port for bunker coal. The mate informed me they were about one hundred miles off Hatteras when the birds were taken. An Osprey also came aboard the same day, and all were easily captured as they were utterly exhausted. There had been a bad storm the day previous. These birds were examined by both my father and me

and pronounced young of the year. We were unable to purchase them from the sailors.— HAROLD H. BAILEY, *Newport News, Va.*

Two Ornithological Fables from Louisiana.— While in Avoyelles Parish, La., recently, the writer heard two interesting bird stories. One concerns the Wood Ibis (*Mycteria americana*). A man told me: "I have heard from my father, and my grandfather, and have heard all my life, that a flock of these birds will alight in shallow water and set to scratching their heads. After all have been doing this a short time, the fish in the place rise and float on the surface stupefied, thus falling an easy prey to the birds."

Although this tale is a great tax upon credulity the writer gave it the benefit of the doubt to the extent of testing the fundamental assertion scientifically. Some minnows were kept in a small aquarium with a good quantity of scaly scurf from the head and neck of a Wood Ibis. The minnows showed no signs of discomfort (during 24 hours) and in fact ate some of the scales. A friend has suggested that if there is anything at all in the story, the probability is that scales being scratched off might attract small fishes in search of food.

The other fable, admittedly a morality tale,¹ I have put in the following form: It is related that one day of the days a dove espied an ant struggling in the water. Moved to compassion, the dove plucked a leaf and laid it on the water near to the ant. The ant climbing thereon was saved from drowning and a favorable breeze springing up, was wafted to shore and his hold on life made sure. At a later time, the dove sitting quietly on a branch of a tree, was drowsily enjoying the beauty of the day. A wicked boy, gun in hand, stealthily approached, and having taken deliberate aim was about to fire. In this extremity the ant, witnessing the turn of events, quickly climbed to the boy's neck and, ere he could pull trigger bit him shrewdly on the ear. The lad disconcerted by the sharp pain, let fall his gun, and with an exclamation, roughly brushed his hurt. All this hubbub aroused the dove who made off in safety.

Moral: Befriend, and you may be befriended.— W. L. MCATEE, *Washington, D. C.*

¹ This evidently old story appears in a different guise in the 'Marvels of Ant Life.' W. F. Kirby, 1898.

RECENT LITERATURE.

Scharff's 'Distribution and Origin of Life in America.'¹ — Dr. Scharff's 'Distribution and Origin of Life in America' is of extreme interest and of great value to every student of the profound and fascinating problems discussed, whether or not his conclusions meet with the reader's acceptance. To the investigator it is extremely welcome for its bibliographical citations and summaries of fact and opinion put forth by his predecessors in the same field. To the layman it may be misleading if too great importance is given to the author's interpretations and inferences.

A striking feature is the confidence the author manifests in his conclusions, regardless in many instances of the present inadequacy of our knowledge of the biology and the geological history of the greater part of the areas he discusses, as though our present information regarding these subjects was to be looked upon as practically final. Climatic conditions as barriers to the distribution of life and the former wide distribution of ancestral types from which their present modified representatives have necessarily descended, appear to receive very little consideration. Resemblances through convergence of characters due to environment between groups geographically widely separated are rarely given serious consideration, and a tendency is evident to belittle the influence of tides, currents, and other fortuitous means of dispersion. The fact that what we do not know of the fossil content and the geological history of vast areas of South America and of other parts of the world that require consideration in the author's theme, is simply immense in comparison with the known, is rarely recognized in the present work. Neither does the paucity of our knowledge of the existing plant and animal life of Central and South America appear to have received due recognition. Among the birds and mammals of these great regions, new species, and often new genera, are discovered in every new collection that reaches the hands of the expert, while the range of many forms long known to science is greatly and often most unexpectedly extended whenever a collector trained in modern methods of field work enters tropical America. As it is safe to say that the mammals and birds of South America and Central America are far better known than the representatives of any other class, it seems not rash to claim that our knowledge of obscure and not easily observed forms of invertebrate life is far too imperfect to warrant dogmatism in treating of their origin and

¹ Distribution and Origin of Life in America | By | Robert Francis Scharff | Ph. D., B. Sc. | Author of "European Animals, their Geological History and Geographical Distribution." | Corresponding Member of the Academy of Natural Sciences, Philadelphia; | of the Senckenberg Natural History Society, Frankfurt am Main; | of the Linnean Society of Bordeaux; and of the Anthropological Society of Paris | New York | The Macmillan Company | 1912 — 8vo, pp. xvi + 497, 16 map. \$3.00 net.

distribution. Yet the author discusses many such questions with an assurance that only a much greater knowledge of the facts in the case than is at present available would warrant.

It must be said, however, that the author has overlooked but little of the available information bearing upon his subject, and that he has used it effectively in so far as it favors his side of the argument. No one author, however, can in these days bring to all the varied facts and problems of such a broad subject the equipment of an expert, and he is thus prone to give to the literature he cites its full face value, especially when it seems favorable to his hypotheses. Slightly differentiated forms, considered not worthy of nomenclatural recognition by the majority of authorities, are usually cited as full species, and groups proposed as subgenera are commonly cited as full genera, although in various instances they are not currently recognized as having even subgeneric value. In the case of the muskox and his ancestry, he has accepted the baseless conclusions of a recent writer on the subject at the author's own estimate, and thus introduced into his work grave errors that it will now be difficult to eradicate from semi-popular sources of information. In some cases, however, he has overlooked information having an important bearing on points considered, as where in his discussion of the evidences in favor of a mid-Atlantic land bridge between the West Indies and Africa (p. 280 and fig. 14) during the early Tertiary, he cites the seals of the genus *Monachus* as evidence of such a connection, which genus he says occurs only in the Mediterranean and Antillean regions, overlooking the fact that a species (*Monachus schauinslandi* Matschie), very closely related to the other two, has been described from Laysan Island in the mid-Pacific! This, it is true, is a comparatively recent discovery,¹ but serves all the more to show the imperfection of present knowledge of the distribution of important types of even mammalian life.

In his discussion of Antillean life the rice-rats (*Oryzomys*) are said to have a "very wide and discontinuous range in North and South America," suggesting an ancient origin. Few groups of American mammals, it is true, range more widely — from southern United States to Terra del Fuego — nor has any a more continuous or unbroken distribution. This is a small error in comparison with the misstatement that one species (*O. antillarum*), known from only a few specimens, collected some thirty years ago, was formerly "so abundant in Jamaica, and did such damage to crops, that the mongoose, a small carnivore, was imported from India for its destruction," the fact being that the destructive rats of Jamaica and neighboring islands are introduced Old World species of the genus *Mus* (= *Epimys*).

In his discussion of the fauna and flora of Florida, Lower California, and Labrador, the author shows a surprising disregard of the controlling influence of temperature and other climatic conditions upon the range of

¹ Matschie, P. Sitzungsab. Gesell. Nat. Freunde, 1905, pp. 254-262.

plants and animals. In referring to the distribution of Florida plants with West Indian affinities, he says: "If birds had any special influence in the transport of seeds, not the southern portion of Florida but the northern one should show affinities in the flora with the West Indies." In other words, if birds had carried seeds during their migrations to northern Florida, the vegetation of this portion of the state should show affinities with the flora of the West Indies, regardless of climatic barriers that we know would prevent their growth. This is only one of many illustrations that might be cited to show the author's disregard of climatic conditions as a factor in determining on a large scale the present restrictions of range of plant and animal life.

In reference to crocodiles and alligators, which are found in both Asia and America, the author says: "The generally accepted theory, I believe, is that some ancestors of the American alligator has travelled northward, and succeeded in crossing the former land bridge across Bering Strait to northeastern Asia, thence wandering southward to China. We possess no fossil evidence for such a belief. All we know is that the rather generalized alligator *Diplocynodon* lived already at the very commencement of the Tertiary Era both in North America and in Europe, and that it persisted in Europe until Miocene times." Of the crocodile he says: "An equally remarkable fact is that the true crocodile has succeeded in obtaining a footing on the North America continent in one single small area, namely, . . . in southern Florida." Yet he cites the occurrence of their fossil remains in the Eocene of Wyoming, but makes no admission of the possibility of their occurrence in Tertiary times at intermediate points between Wyoming and India, in vast regions now paleontologically very little known, or absolutely unknown. On the contrary, he says "it seems surprising that they have not spread more widely in America." He admits that "only a land connection between America and the Old World in early Tertiary times can explain its [crocodile's] present geographical distribution," but he prefers a land bridge across the north Pacific between western North America and eastern Asia to the commonly accepted Bering Strait bridge.

He contends that ten land bridges are necessary to account for the present distribution of animal life in America. These may be listed as follows:

1. A North Atlantic land bridge between Scotland, Greenland, and Labrador during recent geological times.
2. A North Pacific land bridge at Bering Strait, coincident in time with the North Atlantic bridge.
3. A Mid Atlantic bridge between southern Europe and the West Indies.
4. A Mid Atlantic bridge between Europe and southeastern North America.
5. A South Atlantic bridge between eastern South America and West Africa.
6. A South Atlantic bridge between Patagonia, South Africa, and Madagascar, of which he says: "We can gather from all these expressions of opinion by different authors as to the past geological history of South America that there is comparatively little agreement on this subject."

7. A North Pacific land belt between western North America and eastern Asia.
8. A Pacific land belt between North and South America westward of Central America.
9. An Antarctic bridge between Patagonia, Chile, Australia and New Zealand.
10. An Atlantic bridge between Bermuda and the West Indies, Bermuda being part of a continent that extended northward from the West Indies and joined the mainland of North America somewhere near Massachusetts.

The author takes up his subject geographically in fifteen chapters, beginning with Greenland and passing southward to Argentina and Chile, discussing these in succession from the viewpoint of their biology and geological history, with special consideration of their faunistic affinities. It would therefore have been a great convenience to the reader if he had given a topical résumé of the evidence for the ten land bridges he advocates disconnectedly in the course of the book, summarizing the pros and cons for each in a connected way, defining also their presumed extent and continental connections, and their probable geological age and duration. Former supposed land areas and their connections offer a fascinating topic for speculation, but the evidence at present is so meager and conflicting that the conclusions reached are apt to depend upon the temperamental characteristics of the author.

Dr. Scharff has certainly presented us with a work of unusual interest, and one which will stimulate to further investigation of the problems he has so elaborately discussed.—J. A. A.

Brabourne and Chubb: 'The Birds of South America.'¹—The appearance of the first volume of this monumental work will be welcomed by ornithologists the world over. Even though it be merely a list similar in style to Sharpe's 'Hand-List,'—a framework as it were upon which the main structure is to be built up—it is nevertheless of the greatest assistance to students of the neotropical avifauna, as the writer has already had occasion to prove. It is forty years since Sclater and Salvin published their 'Nomenclator Avium Neotropicalium' and we have had no general work on South American birds since. It is moreover a great advance over Sharpe's 'Hand-List' since the references are given in full with type localities and the nomenclature has been made to conform largely with the International Code. Binomials are used, as the authors explain, merely as a matter of convenience, the intention being to work out the relationship of species and subspecies and adopt trinomials in the body of the work.

¹ The Birds of South America by Lord Brabourne, F. Z. S., M. B. O. U., and Charles Chubb, F. Z. S., M. B. O. U. (Zoological Department, British Museum). Vol. 1. London: R. H. Porter, 7 Princes Street, Cavendish Square, W. John Wheldon & Co., 38 Great Queen Street, W. C. Taylor & Francis, Red Lion Court, Fleet Street, E. C. [1912] royal 8vo, pp. i-xix + 1-504 with colored map.

No less than 4561 forms are given in the list, one thousand more than are contained in the Selater and Salvin list and that included Mexico, Central America and the Galapagos all of which are omitted in the work before us. Each species is accompanied by an English name which will be of great assistance to the museum curator in preparing exhibition labels. Some of these names however are unduly cumbersome while others conflict with the names of common North American birds as the use of 'Pewee' for the species of *Empidonax*, of 'Marsh Wren' for *Thryophilus*, etc., we fully appreciate, however, the difficulty of finding English names for over four thousand birds.

One matter of detail, which will of course be corrected in the synonymy, is the failure to quote the name as originally published, so that one cannot ascertain under what generic name a species was described until the reference is consulted. There are also occasional lapses in stating the distributions, for having recently been working over a Venezuelan collection, we note a number of instances where this country is omitted in the ranges of species which are well known to occur there. These are however trifling matters, which should not be seriously charged against a list admittedly only preliminary and which is so excellent and helpful in other respects.

We note a number of changes in names. Some of those which affect North American species are *Columbina* for *Chamepelia*, *Podiceps* for *Colymbus*, *Catharacta* for *Megalestris*, *Pluvialis* for *Charadrius*, *Charadrius* for *Aegialitis* + *Oxyechus* + *Ochthodromus*, *Tringa* for *Helodromas*, *Canutus* for *Tringa*, *Nyroca* for *Marila*, *Oxyura* for *Erismatura*, *Merganser* for *Mergus*, and *Caprimulgus* for *Antrostomus*. *Falco* is divided, *Cerchneis* being used for the Sparrow Hawks; while *Pisobia* is split into *Pisobia* and *Heteropygia*. We note also the use of *Sula dactylatra* Lesson 1837 in place of *S. cyanops*, and *Egretta thula* Molina 1782 for the Snowy Heron, while the Black Vulture, at least so far as South America is concerned, stands as *Catharista fælanis*. Some of these changes are undoubtedly necessary but in other cases we think the A. O. U. Check-List is correct.

Ornithologists everywhere will look forward with interest to the succeeding parts of this long needed work.—W. S.

Oberholser's 'A Revision of the Forms of the Great Blue Heron.'¹

—In this carefully prepared monograph, Mr. Oberholser treats the Great Blue Heron as he has previously discussed the Green Heron. Plumages are described in detail and there are numerous tables of measurements and lists of localities from which specimens have been examined.

The races recognized are as follows with approximate breeding ranges: *A. herodias herodias*, eastern North America exclusive of Lower Austral zone; *A. h. wardi*, southeastern U. S., mainly Lower Austral zone; *A. h. adoza* subsp. nov., Bahamas and West Indies; *A. h. treganzai*, western U. S.

¹ A Revision of the Forms of the Great Blue Heron, *Ardea herodias* Linnæus. Proc. U. S. Nat. Mus., Vol. 43, pp. 531-559. December 12, 1912.

north to the Transition zone, east of the coast district; *A. h. sanctilucae*, southern Lower California; *A. h. cognata* Galapagos Islands, *A. h. hyperonca* subsp. nov., Pacific coast region of U. S.; *A. h. oligista* subsp. nov., Santa Barbara Islands, California; *A. h. fannini*, Pacific coast of north-western North America; *A. h. lessonii*, Mexico to northern South America. — W. S.

Torrey's 'Field-Days in California.'¹ — Our pleasure in turning the pages of this last volume of Bradford Torrey is mingled with sadness at the thought that the pen, which for so many years depicted for us the ever-changing face of nature, is forever stilled.

This little book treats of the experiences of the last few years of his life, which were spent in California; and it is particularly interesting to those bird-lovers who are familiar only with the Atlantic slope as it depicts so vividly the easterner's impressions of the birds of 'the coast.'

There is a frontispiece portrait of the author and eight plates illustrating localities treated in the book, in two of which Mr. Torrey himself appears. The Chapter headings are, A California Beach; In the Estero; An Exciting Forenoon; A Long Procession; A Visitation of Swans; My First Condor; My First Water-Ouzels; An Unsuccessful Hunt; Yellow-billed Magpies; Some Rock-haunting Birds; Under the Redwoods; In the Santa Cruz Mountains; Reading a Check-List; On Foot in the Yosemite; A Bird-Gazer at the Grand Cañon.

The Chapter on the A. O. U. Check-List will be read with much interest and the Committee we feel sure will be gratified with Mr. Torrey's opinion of this volume, that 'there's plenty of good reading in the Check-List,' while they will be surprised to see what inspiration he derives from its pages.

'Field Days in California' will take its place as the fitting completion of a series of nature studies which will continue in the future, as they have in the past, to delight all lovers of the great out doors, to sharpen our powers of observation and to help us the better to appreciate what we see. — W. S.

Nelson on Two New Birds from Panama.² — The specimens here described are from the rich collections made by Mr. E. A. Goldman on the Smithsonian Survey of Panama. Mr. Nelson names them *Capito maculicoronatus pirrensis*, the Mount Pirri Barbet, and *Pseudotriccus pelselni berlepschi*, the Berlepsch Flycatcher. — W. S.

Bent on a New Crossbill from Newfoundland.³ — A series of eleven Crossbills obtained by Dr. L. C. Sanford in Newfoundland prove to be

¹ Field-Days in California | By | Bradford Torrey | With Illustrations from Photographs | [vignette] | Boston and New York | Houghton Mifflin Company | The Riverside Press, Cambridge | 1913. 12mo, pp. 1-235. Frontispiece portrait and eight half-tone plates. \$1.50 net.

² Two New Species of Birds from the Slopes of Mount Pirri, Eastern Panama. Smithsonian Misc. Collec., Vol. 60, No. 21, pp. 1-2. February 26, 1913.

³ A New Subspecies of Crossbill from Newfoundland. By A. C. Bent. Smithsonian Misc. Collec., Vol. 60, No. 15, pp. 1-3. December 12, 1912.

larger and deeper colored than *Loxia curvirostra minor* with a larger and heavier bill. Mr. Bent proposes to separate them as a distinct race under the name of *Loxia c. percua*.— W. S.

Mearns on a New African Grass Warbler.¹—To the several new forms of *Cisticola* recently described by Dr. Mearns he now adds another *C. prinoides wambugensis* from Wambugu, British East Africa, obtained in 1909 on the Smithsonian Africa Expedition.— W. S.

Ornithology in the Smithsonian Report for 1911.—Among the reprinted articles which form part of the Annual Report of the Smithsonian Institution for 1911 four deal with birds. These are 'A History of Certain Great Horned Owls,' by Charles R. Keyes, from 'The Condor,' 1911; 'The passenger Pigeon,' accounts by Pehr Kalm, from 'The Auk,' 1911 and by J. J. Audubon, (Ornithological Biography, Vol. 1); 'On the Position Assumed by Birds in Flight,' By Bentley Beetham, from 'British Birds,' 1911; and 'Note on the Iridescent Colors of Birds and Insects,' By A. Mallock, 'Proceedings of the Royal Society,' London, 1911.— W. S.

Horsbrugh's Game-Birds and Water-Fowl of South Africa.²—The concluding part of this attractive work is now before us and it fully maintains the high standard of the earlier parts. Fifteen species of Anatidae and the Hadada Ibis are figured and described. The last Major Horsbrugh tells us is "not really a game bird but is most excellent eating and is always a welcome addition to the bag." The index, preface and title page accompany this installment and it is to be regretted that there is not an abstract of the laws of South Africa defining and protecting gamebirds.— W. S.

Hellmayr on Birds from the Mouth of the Amazon.³—This valuable contribution to Brazilian Ornithology is prepared with the same skill and carefulness that characterizes the work of the author and further illustrates his broad knowledge of the neotropical avifauna.

The paper is divided into six parts.

I. 'A review of the birds collected in the Para district'; a fully annotated list of 179 species, with discussion of ranges and relationship with allied forms.

¹ Description of a New African Grass-Warbler of the Genus *Cisticola*. By Edgar A. Mearns. Smithsonian Misc. Collec., Vol. 60, No. 20, pp. 1-2. February 14, 1913.

² The Game-Birds and Water Fowl of South Africa by Major Boyd Horsbrugh, with Colored Plates by Sergeant C. G. Davies, Part 4. London. Witherby & Co., 326 High Holburn. December 11, 1912.

³ Zoologische Ergebnisse einer Reise in das Mündungsgebiet des Amazonas herausgegeben von Lorenz Müller. II. Vogel von C. E. Hellmayr. Abh. Königl. Bayern. Akad. Wiss. XXVI, 2. pp. 1-142. November 15, 1912.

II. 'A revision of the Avifauna of the Para district,' comprising a list of collectors, localities, a bibliography and a systematic list of 379 species with localities from which specimens have been recorded. *Dysithamnus mentalis emilae* is described as new from San Antonio do Prata.

III. 'Report on the birds collected on the Island of Mexiana' annotated list of 39 species.

IV. 'Revision of the birds of Mexiana Island' 157 species listed.

V. Report on the birds collected on the Island of Marajo'; annotated list of 40 species.

VI. 'Zoogeographic consideration of the Avifauna of the region about the mouth of the Amazon.'

Such contributions as this are bringing our knowledge of the avifauna of South America nearer and nearer to that state of accuracy which characterizes the ornithology of North America, and this paper of Mr. Hellmayr's will prove of great assistance to investigators of the bird life not only of the Para district but of other more or less contiguous areas.—W. S.

McAtee's 'Index to U. S. Department of Agriculture Publications on the Food of Birds.'¹—So numerous are the publications of the U. S. Department of Agriculture, dealing with the food habits of birds, that an index such as Mr. McAtee has prepared is a practical necessity if we are to readily find the information that we seek. The index covers 131 documents, referring to the economic status of no less than 401 species of native birds and 59 foreign or introduced species. A bibliography precedes the index proper and the latter is remarkably full, with an abundance of sub-headings under each species giving the various items of food and other details, which greatly aid the economist in finding just the information he desires.—W. S.

Craig's Studies of Bird Behavior.²—Mr. Craig describes in detail the hatching of two young doves (*Turtur risorius*). The birds made a series of strong movements with several seconds rest between; each movement seemed to consist of (1) a pushing lengthwise, (2) a thrusting of the bill through the shell, or sometimes only bulging it, (3) a turning round a few degrees which brought each bill thrust a little beyond the last. Mr. Craig finds only two recorded instances of the observation of the hatching of wild birds *i. e.* by W. H. Hudson, 'The Naturalist in La Plata' and R. T. Moore, 'The Auk' 1912, p. 218, dealing with the Jacana and Least Sandpiper respectively. It would seem therefore that there was opportunity

¹ Index to Papers Relating to the Food of Birds by Members of the Biological Survey in Publications of the United States Department of Agriculture, 1885-1911. By W. L. McAtee. U. S. Dept. Agr., Biological Survey, Bull. No. 4. Washington, 1913. pp. 1-69.

² Behavior of the Young Bird in Breaking out of the Egg. By Wallace Craig. Jour. Animal Behavior, July-August, 1912, pp. 296-298.

Observations on Doves Learning to Drink, *do.*, pp. 273-279.

here for some valuable observations and it is strange that a field which lies open to every student of bird life has been so universally neglected.

In another paper the same author discusses young doves learning to drink and concludes that the first drinking is an involuntary reflex act when the bill becomes accidentally submerged and the inside of the mouth is moistened. The difference in the method of drinking in pigeons and domestic fowls is emphasized.—W. S.

Tschusi zu Schmidhoffen on Austrian Ornithological Literature for 1911.¹—A bibliography of about 400 titles, many of them local and popular, and many from journals not readily accessible in America. The list is carefully prepared and forms a valuable paper of reference while it impresses one with the enormous amount of ornithological literature that is being put forth in the world today.—W. S.

Mrs. Myers' 'The Birds' Convention.'²—This attractively printed little book is designed to interest young folk in birds and bird protection. For very little children a book of this sort, in which the birds are personified, will no doubt prove attractive, but as they grow older boys and girls, we think, soon prefer something that is not quite so obviously intended for the young. The half-tones with which the work is illustrated are excellent.—W. S.

Grinnell on Conserving the Band-tailed Pigeon as a Game Bird.³—Mr. Grinnell treats at length of the distribution, food, nesting, economic status etc., of this valuable bird in California. He concludes from the evidence collected that though widely scattered in the breeding season, in winter all the individuals inhabiting the Pacific coast gather in the valleys and foot hills of west, central and southern California. It is obviously during the latter season that the species is in danger of extermination and Mr. Grinnell considers that the decimation has gone so far that a close season of five years is the only way to bring the birds back to a status that will warrant an annual open season. Up to the present time the Band-tailed Pigeon has been left practically unprotected and its slow rate of increase—only one young being reared by each pair—has failed to keep pace with the winter slaughter, which in 1911-12 was very heavy.

¹ Ornithologische Literatur Österreich, Bosniens, und der Herzegowina, 1911. Von Viktor Ritter von Tschusi zu Schmidhoffen. Verhandl. der k. k. zool.-botan. Gesellsch. in Wien. 1912. pp. 260-289.

² The Bird's Convention. By Harriet Williams Myers, Secretary California Audubon Society, with Illustrations from Photographs by the Author. Western Publishing Co., Los Angeles, Cal., 1912. pp. 1-81. 75 cents, postage 6 cts.

³ The Outlook for Conserving the Band-tailed Pigeon as a Game Bird of California. The Condor, January, 1913. pp. 25-40.

California should take heed of Mr. Grinnell's timely warning and not repeat on the Pacific slope the ever-to-be-regretted folly that was perpetrated in the case of the Passenger Pigeon in the east.— W. S.

Henshaw's 'Fifty Common Birds of Farm and Orchard.'¹— This admirable publication is designed as an 'Educational Leaflet' to aid people, especially in the more remote parts of the country, to become familiar with their more important bird friends. It will undoubtedly reach hundreds of persons who are quite out of touch with more general works on ornithology and do a world of good.

The great desideratum in such a pamphlet *i. e.* colored illustrations which will render unnecessary the tedious and bulky printed description, has been met by fifty excellent color figures from paintings by Fuertes, which are run into the text, two on a page, somewhat after the style of Reed's 'Bird Guide.' The accompanying text which is of necessity very limited is admirably compiled. The length of the bird is given, sometimes with a line or two on color or form; and then come two paragraphs covering 'Range' and 'Habits and Economic Status,' with frequent reference to other publications of the Biological Survey. An introduction of six pages covers forcibly the principles of economic ornithology.

Taken in its entirety we doubt if so much sound ornithology has ever been presented in such a small space and the pamphlet should not only enlist a multitude of recruits in the cause of bird protection but it should develop a number of ornithologists as well. It is to be hoped that this 'Bulletin' will not be allowed to go 'out of print.' Perhaps by coöperation between the Agricultural Department and the Audubon Societies it might be kept always available.— W. S.

Three Important Economic Reports.— In this annual report as Chief of the Biological Survey, Mr. H. W. Henshaw² presents the usual interesting summary of the work of this important division of the Department of Agriculture. The relation of birds to the Alfalfa and Boll Weevils, and the Chestnut-bark Disease, have been investigated, and publications continued on the food habits of various common birds. The bird-life of Porto Rico and Alabama has been studied as well as the status of the English Sparrow and European Starling and means of trapping the former.

Under importations it is interesting to know that upwards of 457,000 live birds were brought into the United States during the year 1912, of which 362,604 were canaries, 50,086 were game birds and 44,387 non-game birds other than Canaries.

The California Associated Societies for the Conservation of Wild Life³ have issued a pamphlet entitled 'Western Wild Life Call' which contains

¹ Fifty Common Birds of Farm and Orchard. Farmer's Bulletin 513, U. S. Dept. Agriculture, 1913. pp. 1-31.

² Report of the Chief of the Bureau of Biological Survey for 1912. By Henry W. Henshaw. Annual Reports of the Dept. of Agriculture, 1912. pp. 1-24.

³ Western Wild Life Call. Published by the California Associated Societies for the Conservation of Wild Life. Feb. 7, 1913. pp. 1-16.

strong articles from the leaders in this movement and direct appeals for the passage of desirable legislation now before the state law-makers. The illustrations and diagrams are striking and convincing.

Mr. E. H. Forbush¹ in his fourth annual report as state ornithologist of Massachusetts, considers bird boxes, English Sparrow traps and the economic importance of certain species of native birds. Most interesting however is the account of the presence of a flight of White Egrets in the state during parts of July and August. Four of the birds were shot and three of the shooters were arrested. With increased protection in the south these visitations should soon be of annual occurrence.—W. S.

Economic Ornithology in Recent Entomological Publications.—

Since the first investigations of the gypsy moth in the United States birds have been given a greater or less share of the blame for the continued spread of the pest. The evidence that has been brought forward is reviewed by A. F. Burgess in his recent bulletin² on 'The Dispersion of the Gypsy Moth' and in summing up he concludes that birds are practically guiltless.

Mr. Burgess takes about the same view of the experimental evidence that birds may distribute gypsy moth eggs, as that expressed by the reviewer in the April, 1911, *Auk* (pp. 285-286). With regard to Collins' experiments on English Sparrows and pigeon he says: "These experiments indicate the extreme improbability of either of these birds selecting gypsy moth eggs for food, and the chances of the insect being disseminated in this way appear very slight" (p. 13). With regard to Reiff's experiments Mr. Burgess says: the "conclusions seem too sweeping because of the large percentage of the eggs [that had passed through the digestive tracts of the birds] that failed to hatch, and when the conditions under which the birds were fed is considered it is doubtful whether comparable result would be secured under natural conditions" (p. 14).

The chances of the dispersion of the moth through the dropping of caterpillars picked up and carried to a distance by birds are considered very remote. Of all the suggested modes of distribution by birds, the only one held at all probable is the carrying of twigs bearing egg clusters, by crows, hawks and other large birds, and the opinion is expressed that although "this may happen in some cases . . . it would result in local rather than long distance dispersion." The final conclusion is that "the evidence is wholly inadequate to prove that birds were responsible for distributing the gypsy moth to the large area which was annually becoming infested" (p. 15). The chief means of the dispersion is the wind which carries about the young larvae. The latter are provided with aerostatic hairs.

Wild birds receive much credit as enemies of locusts in the Philippines.

¹ Fourth Annual Report of the State Ornithologist. By Edward Howe Forbush. Fifty-ninth Annual Rept. State Board of Agriculture. [Mass.] 1912 pp. 1-32.

² Bull. 119, U. S. Bureau of Entomology. 1913. 62 pp.

Messrs. Jones and Mackie, writing of the locust pest in *The Philippine Agricultural Review*¹ (Vol. VI, No. 1, Jan. 1913) say that the migratory locust is, and for many years has been, the worst destructive insect pest of the Philippines, and that their enemies the wild birds "are of more importance than is generally believed for they, from the very first appearance of the young locusts as they issue from the ground, wage a continuous warfare upon the swarm." (pp. 18-19.) The chief locust destroyers are the Luzon Shrike (*Otomela lucionensis*), Carabao Bird (*Bubulcus coromandus*), two species of kingfishers, Variegated Curlew (*Numenius variegatus*), Golden plover (*Charadrius fulvus*), two species of quails, the Jungle Fowl (*Gallus gallus*), Roller (*Eurystomus orientalis*) and two species of bee eaters.

In an account of the insect enemies of cacao, P. L. Guppy says:² "it would seem that all birds are useful to the cacao planter, especially those of the woodpecker type, even though some of the latter do occasionally make holes in pods." The King-of-the-Woods (*Momotus swainsonii*) also accused of eating pods, is shown to be chiefly insectivorous and to be an enemy of the cacao beetle, the plant's most serious insect pest. "Birds and lizards" says the author "are the planter's best friends." — W. L. M.

More Economic Papers by Bryant. A Correction.—Mr. H. C. Bryant's activity in his capacity as a research assistant, under the auspices of the California State Fish and Game Commission, has been so great and the results so promising, that ornithologists will regret to learn of the discontinuance of the work. Two papers incidental to the investigation of the food of the western meadowlark have recently appeared. These are: "The number of insects destroyed by western meadowlarks"³ and "Some insects and other arthropods in the diet of the western meadowlark."⁴ In the first it is shown that western meadowlarks in certain localities in California consumed on the average 10 cutworms or 10 grasshoppers per meal, exclusive of other food. Thus each bird at the lowest estimate was destroying from 40 to 80 of one or the other of these groups of insects per day throughout the summer, and according to Mr. Bryant such cases prove that birds "play a much more important part as checks on the numbers of insects than many people have hitherto believed."

In the second paper the author gives a general review of the arthropods found in stomachs of the western meadowlark. "The ordinary articles of diet are ground beetles (Carabidae, Tenebrionidae) grasshoppers, crickets, cutworms, wireworms, plant bugs (Pentatomidae) certain bees, wasps and ichneumon flies and ants. The extraordinary articles of diet can be summed up as: centipedes, millipedes, scorpions, certain crustacea, snails, spiders, and protected and stinging insects." It should be noted that the

¹ Review of preliminary paper in *Auk*. 28. Oct., 1911, p. 506.

² *West Indian Bulletin*. XII, No. 3, 1912, p. 311.

³ *Science*, N. S. 36, pp. 873-875, Dec. 20, 1912.

⁴ *Pomona College Journal of Entomology*. Vol. 4, No. 3, Nov. 1912, pp. 807-809.

last two classes named are by no means distinct categories from the preceding items of the list, as Carabidæ, Tenebrionidæ, Pentatomidæ, bees, wasps, ichneumon flies, ants, centipedes, millipedes, scorpions and spiders (11 out of 15 categories) are themselves classed by the Poulton school as protected insects. If all of the so-called protected classes of insects were really protected from the attacks of birds, the latter certainly would be hard put to it to find a living. But they do live and feed, I may safely say, without prolonged consideration of the theoretically protected condition of so much of their prey. The special instances of supposedly protected insects being eaten that are pointed out by Mr. Bryant, are the following: "millipedes . . . usually considered to be well protected . . . by certain secretions which produce a pungent odor"; cow killers (Mutillidæ); and the very hairy larva of *Euxanessa antiopa*.

In a review in the last number of 'The Auk' of one of Mr. Bryant's papers, the writer thoughtlessly did an injustice by contrasting one of Mr. Bryant's statements about conditions in California with conclusions drawn entirely from Eastern experience. This was in regard to food supply being in the last analysis the most important factor limiting the numbers of birds. In the humid east there is no doubt that food supply is *not* of primary importance in determining the numbers of at least the *seed-eating* birds. Regarding a climate where long and continued droughts prevail, a different conclusion is no doubt justifiable. Especially if a drought begins early in the summer after most of the seeds have sprouted, and new ones are not yet formed, the crop of seeds for that and the succeeding year will be very greatly reduced. Under such circumstances it is conceivable that seed-eating birds if present in abundance might have difficulty in finding sufficient food. We know that in Australia where droughts and rainy seasons endure for series of years, that almost the whole bird population shifts from place to place and that with many species, reproduction is carried on only in the rainy districts where food is plentiful.

The reviewer regrets his careless comment on this point, and hopes the present explanation will make clear that his purpose at least is to stick as close to facts as possible.—W. L. M.

Relation of the Turkey-buzzard to Diseases of Live-stock.—In the past few years wide currency in the South has been given to the accusation that Turkey-buzzards spread such diseases of live-stock as hog-cholera, black-leg and anthrax. This scavenger therefore has been threatened with persecution in the land where heretofore it has received the most zealous protection. It is of great interest that the results of a scientific study of "Anthrax of animals in Panama, with a note on its probable mode of transmission by buzzards"¹ show that the transmission of the disease probably never occurs in the way ordinarily supposed, *i. e.* by the voiding of live bacilli in the feces of buzzards. The authors, Drs. S. T. Darling and L. B. Bates, describe their results as follows, beginning with observations on the

¹ Amer. Vet. Rev. 42, No. 1, Oct., 1912, pp. 70-75.

habits of buzzards when feeding on carrion: "They congregate about a dying animal, plucking out the eyes and tearing off soft parts even before death. Thus they pick away the mucosa of the anterior nares, pluck out the eyes and the soft parts around the anus and sheath. As decomposition advances and the tissues soften, the birds crowd into and upon the carcass, literally smearing the decomposed material over their plumage. In the case of an animal dying of anthrax, the tissues contain enormous numbers of bacilli. These in contact with air on the plumage of the bird go into spore formation, and buzzards most certainly act as carriers of infection, by transporting anthrax bacilli and spores from one place to another in this way. Some personal (immediate) contact with animals or pastures would be necessary in this case for infection. If, however, the spores of anthrax bacilli pass intact through the intestinal tract of buzzards, pastures might be infected from the droppings of birds that had fed on animals dying of anthrax.

"The following experiments were carried out to determine the likelihood of that possibility. Three Turkey-buzzards were selected from a lot supplied through the kindness of the Health Officer, Panama, and the Sanitary Inspector at Empire. The buzzards were kept in an isolated room and were given a plentiful supply of drinking water and chopped meat. This meat was thoroughly soaked and mixed with a saline emulsion of anthrax bacilli and spores grown on agar plates. On account of the filthy habits of the birds, it was impracticable to obtain specimens of feces in which food contamination could be ruled out except by holding the birds and inserting a swab or catheter into the cloaca. Abundant material was obtained in this way. Specimens were taken at approximately 12, 36, 60 and 84 hours after feeding. Numerous agar plates were immediately made, but in none was the anthrax bacillus present.

"In order to introduce a maximum number of the bacilli, the experiment was repeated with the following variation: Instead of mixing food and cultures a rubber catheter was introduced into the gullet of the buzzard and about 20 c. c. of a very heavy saline emulsion of anthrax bacilli and spores were injected through a catheter into the stomach by a Luer syringe. The buzzards were watched to see that they did not regurgitate or otherwise unlawfully dispose of the dose. Agar plates were made as before, and anthrax bacilli were found to be absent. Shortly after these experiments were completed the birds were killed and cultures taken from various portions of the intestinal tract. Anthrax bacilli were absent.

"We conclude from this experiment that pastures and other locations cannot be infected by buzzards through the agency of droppings, but require more intimate contact.

"The experiment just outlined illustrates the very powerful digestive mechanism of buzzards for bacteria, and when we consider that the food of carrion birds is sometimes almost wholly bacteria and bacterial products, we are not surprised at the facility with which they appear to destroy all bacterial species" (pp. 74-75).

From the above experiments it is clear that the possibility of buzzards

transmitting anthrax is small. Drs. Darling and Bates show that it is practically impossible by agency of the dejections of the birds, and it is obvious that the other possible mode requiring actual bodily contact of the buzzards with live-stock is not likely to be in operation often.

An investigation of "Carrion feeders as disseminators of Anthrax or Charbon,"¹ by Dr. Harry Morris, of the Louisiana Agricultural Experiment Station, confirms the findings of Drs. Darling and Bates with regard to the destruction of the disease bacilli by the digestive processes of the buzzard. Dr. Morris says "no anthrax was found in the posterior part of the digestive tract, none being found beyond the stomach, and but little in that organ. These experiments show quite conclusively that the anthrax bacteria do not pass through the digestive tract of the buzzard and consequently are not disseminated in the droppings of these scavengers." (p. 6.)

It was found that anthrax bacilli remain alive upon the beaks and feet of buzzards for at least 48 hours. The author therefore thinks that pasturage and water might be contaminated in this way, and thus become sources of infection. He says anthrax spores will live in water for years without decrease in virulence. Fortunately Dr. Morris included other carrion feeders in his experiments. It was found that (1) "Anthrax spores are not destroyed in the digestive tract of the dog. They were found in the feces six days after anthrax had been fed." (2) "The feces of the hog contained anthrax for a period of five days after eating the spores." (3) "Anthrax was found in the feces of the cat for a period of four days after eating anthrax spores." (4) "Anthrax is not destroyed in the digestive tract of the opossum." (5) "We were unable to produce anthrax in chickens, but the spores were not destroyed in the digestive tract. The feces contained anthrax for a period of forty-eight hours after eating spores." (6) "Anthrax is present on the bodies and feet and the excrement of flies that have been feeding on infected carcasses." (p. 16.) "What is the importance of this fact? Cobb has shown that a fly will defecate on an average of once every five minutes, or twelve times an hour. If anthrax spores are excreted for a period of ten hours — and it has been proven that they are carried for a much longer time — in that time the fly will defecate one hundred and twenty times. The fly after feeding on an infected carcass would doubtless deposit these germ-laden "specks" over a considerable area and may start a number of centers of infection." ...

"Knowing that the fly carries anthrax in the digestive tract and on its body, it is possible that it is one of the chief causes of our severe outbreaks of anthrax. Quite often carcasses are allowed to remain where the animals die, and in these cases the flies eat on the anthrax material, spreading the infection over considerable areas." (p. 13-14.)

It would appear, therefore, that the buzzard has much the best record of any of the carrion feeders studied, as it is the only one that does not, distribute anthrax bacilli in its feces. Some of the other animals, as the dog,

¹ Bull. 136, La. Agr. Exp. Sta., Nov. 1912, 16 pp.

opossum and swine are just as apt to contaminate water as the buzzard (pasturage also in the case of hogs), and the dog and chickens are far more likely to carry infection by bodily contact with other domestic animals than the buzzard. It seems evident therefore that at the same time that steps are being taken to greatly reduce or exterminate a wild bird — the buzzard — which may possibly play a minor part in the transmission of anthrax, farmers are harboring several domestic animals that have far greater possibilities as spreaders of the disease. The fact that the disease may be carried by flies is more than sufficient to explain the most severe epidemics.

However, the real fault lies with none of these animals, but with man himself. Dr. Morris says "we believe that the neglect to properly dispose of anthrax carcasses is, without doubt, the factor most responsible for the continuance and spread of anthrax." (p. 16.) In accordance with the most primitive ideas of sanitation, the cleaning up of all kinds of matter likely to become the source of disease, has too long been left to the buzzard, opossum and the domestic scavengers in the South. It is inexcusable to wage warfare upon a bird which cannot harm us unless we give it the opportunity by our own criminal negligence. Let the farmers bury deeply all animals dying on their premises, doing this as promptly as possible after death, and there will soon be no reason for laying blame for the transmission of stock-diseases upon any animal, wild or domestic.—W. L. M.

Cassinia, 1912.¹ — Under the new regime 'Cassinia' remains the same interesting yearbook of an ornithological club that evidently is very much alive. We note that Mr. Stone, the former editor, is the principal contributor, three articles being credited to him. One is a sympathetic sketch of the life of General George A. McCall, who was one of the chief aids to Cassin in the preparation of his book on the 'Birds of California and Texas.' Mr. Stone presents also the customary summary of observations on the migration of birds in the vicinity of Philadelphia. A slightly larger number of migrants arrived later than the average date of arrival than earlier. Attention is called to the greater variation in this respect of the earlier migrants. Two striking features pointed out are the scarcity of Bluebirds and the unusual abundance of Goldfinches in April.

Another article on migration, by Professor W. W. Cooke, contrasts the dates of arrival in 1791 as recorded by Dr. Benjamin S. Barton with the average dates for recent years. There is no significant variation in the lists at opposite extremes of more than a centenary period. Barton's publication contains the earliest record of the Swallow-tailed Kite for Pennsylvania, one of the very few records of the Carolina Parakeet for that state and the only one for New York.

Mr. Julian K. Potter contributes a 'Preliminary Report on Roosting Habits of the Purple Grackle in the Delaware Valley.' He finds that no

¹ Cassinia. A Bird Annual. Vol. XVI. Philadelphia, 1912, 72 pp.

particular type of growth is favored for a roosting place, that the same roosts are resorted to year after year, and that persecution, other than the destruction of trees does not affect roost stability. The number of birds in the roosts constantly increases up to the last of September and the main body of the birds leaves about the last week of October.

This volume of 'Cassinia' contains also a reprint of a newspaper article relating to a great nesting of Passenger Pigeons in Forest and Warren Counties, Pa., in 1886; a collection of reminiscences of Philadelphia collections and collectors, by Dr. Spencer Trotter; a bibliography of Pennsylvania ornithology for 1912; a list of members and the proceedings of the Delaware Valley Ornithological Club. The average attendance of the 15 club meetings during the year was 22, and it is stated that only once in 15 years has the average fallen below 19. This is a record of which any local ornithological club might well be proud.— W. L. M.

The Ornithological Journals.

Bird-Lore. Vol. XV, No. 1. January-February, 1913.

The Duck Hawks of Taughannoek Gorge. By A. A. Allen and H. K. Knight. With excellent illustrations.

Local Decrease in Bluebirds. By W. W. Cooke.— Affected area lies just north of the regular winter range.

Notes from Labrador. By A. C. Bent.

The Migration of North American Sparrows. By W. W. Cooke.— The Snow Buntings. Plumage notes by Chapman and color plate by Fuertes. Bird-Lore's Thirteenth Bird Census.— 199 lists are published.

The Hudsonian Curlew by A. C. Bent and the Ruffed Grouse by Geo. Bird Grinnell are the 'Educational Leaflets.'

The Condor. Vol. XIV, No. 6. November-December, 1912.

Study of the Eggs of the Meleagridæ. By R. W. Shufeldt.

Nesting of the Rocky Mountain Nuthatch. By F. C. Willard.

A Horseback Trip across Montana. By Aretas A. Saunders.

Nesting Habits of the Western Bluebird. By Harriet W. Myers.

W. L. Slater presents a reply to W. W. Cooke on his 'Birds of Colorado.'

The Condor. Vol. XV, No. 1. January-February, 1913.

A Glimpse of Surf-Birds. By W. L. Dawson.— Illustrated by a series of remarkable photographs.

Concealing and Revealing Coloration of Animals. By Junius Henderson — A general review of the problem.

Swallows and Bed-bugs. By Edw. R. Warren.— Need of more data on bird parasites emphasized.

Notes on Some Fresno County Birds. By John G. Tyler.— Six species discussed.

Bird Notes from the Coast of Northern Lower California. By George Willett.— Annotated list of 98 species.

The Outlook for Conserving the Band-tailed Pigeon as a Game Bird of California. By Joseph Grinnell. (See p. 291.)

The Oölogist. Vol. XXIX, No. 11. November 15, 1912.

The Pine Siskin breeding in Pennsylvania. By R. B. Simpson.

An Orange County [Fla.] Wood Ibis Rookery. By Donald J. Nicholson.

The Oölogist. Vol. XXX, No. 1. January 15, 1913.

Two Weeks Collecting in the High Sierras. By H. W. Carriger.

The Wilson Bulletin. Vol. XXIV, No. 4. December, 1912.

Prothonotary Warblers nesting at Riverside, Illinois. By Orpheus M. Schantz.

Food of Herons and Ibises. By Oscar E. Baynard.

A Robin's Roost. By A. J. Stoyer.

The Birds of Pelee Island, Ontario, Canada. By Lynds Jones.

The Brown Thrasher East and West. By Althea R. Sherman.

The Ibis. X Series. Vol. I, No. 1. January, 1913.

On a rare Species of Touracou (*Turacus rufipolii*). By T. Salvadori.— A colored plate and detailed description of the unique specimen in the Museum of Genoa, obtained by Prince Ruspoli near Abai Lake, Abyssinia.

A Third Contribution to the Ornithology of Cyprus. By John A. Bucknill.— A summary of the author's studies during a residence of some years, which has just terminated. A good map is presented, together with a discussion of the game and game laws, and notes on a number of species.

Note on a new Species of Pucras Pheasant found in the Province of Anhwei or Ngan Hwei, China. By Rev. F. Courtois.— Colored figure of *Pucrasia joietiana* and a key to the species of the genus.

The Birds of Hong Kong, Macao, and the West River or Si Kiang in South-East China, with special reference to their Nidification and Seasonal Movements. By R. E. Vaughan and K. H. Jones.— The first instalment covers 102 species, the habits of many of which are treated at considerable length. The paper is based upon the authors' field experience covering a number of years.

Notes on the Birds collected by the B. O. U. Expedition to Dutch New Guinea. By W. R. Ogilvie-Grant.— Reprinted "with a few additional notes and slight alterations" from Mr. Wollaston's 'Pygmies and Papuans,' with a full bibliography.

Commentary on the 'Hand-list of British Birds.' By P. L. Selater.— This consists of a history of the adoption of the Stricklandian Code and a plea for its use rather than the International Code in preparing a British list. The names of the new 'Hand-list' and the old 'B. O. U. List' are given in parallel columns showing that 200 out of the 376 have been changed to a greater or less extent. Dr. Selater presents no new arguments, but reiterates his opposition to changes of any kind and to the use of tautonyms and the tenth edition of Linnæus.

Solander as an Ornithologist. By Tom Iredale.— An interesting account of Solander and Banks and the rediscovered manuscripts on the *Procellariidæ* of Cook's first Voyage.

British Birds. Vol. VI, No. 7. December, 1912.

Migration Notes from Holy Island, Northumberland, Autumn, 1912.

By H. F. Witherby.—Records of species rare or new to the county. Numerous records of recovered marked birds are given in this number.

British Birds. Vol. VI, No. 8. January, 1913.

Notes on the Bird Life of South-west Iceland. By Rev. F. C. R. Jourdain.

William Bernhard Tegetmeier. By F. W. Smalley.

Recovery of marked birds.

British Birds. Vol. VI, No. 9. February, 1913.

Field-Notes on a Pair of Stone-Curlews. By F. G. Penrose.—Observations from a photographer's tent, which led Dr. Penrose to surmise that these birds had some sense of smell which led them to be suspicious of his presence. He attributes a sense of smell only to ducks and possibly to certain waders. The paper is illustrated by a color plate taken direct from a Lumière autochrome.

The British Black Grouse (*Lyrurus tetrix britannicus*, subsp. nov.) By H. F. Witherby and Einar Lönnberg.

Barrow's Golden-eye and the Common Golden-eye. By H. F. Witherby.—Difference in scapular-feathers illustrated and described, also difference in frontal bone.

The Avicultural Magazine. Vol. IV, No. 2. December, 1912.

Successful Breeding of the Grand Eclectus Parrot. By Miss Drummond.

Breeding of the Hooded Siskin (*Chrysomitris cucullata*.) By Dr. M. Arnsler.

Evidence afforded by Captive Birds. By Dr. Arthur G. Butler.—Discusses some of the points raised by Mr. W. L. McAtee in his recent paper on 'Warning and Cryptic Colors.'

The Plumage Question and Aviculture. By J. Lewis Bonhote.—A discussion of the Egret problem and the possibility of rearing them in captivity. A French firm has offered a prize of \$2000 for the first Egret farm established on French territory with no result as yet. As is pointed out the experiment would involve a far greater expenditure than this, and even so, the practicability of the venture seems extremely doubtful.

The Avicultural Magazine. Vol. IV, No. 3. January, 1913.

Articles on Breeding of the Hooded Parakeet, and on Bengalese Rice Birds and Nuthatches in captivity.

Some Spontaneous Variations in Mallard and Muscovy Ducks. By Frank Finn. (Continued in February.)

The Bird Show at Horticultural Hall. By Herbert Goodchild.

The Avicultural Magazine. Vol. IV, No. 4. February, 1913.

The Mexican Pied Ground Thrush (*Geocichla* [= *Ridgwayia*] *pinicola*.) By Hubert D. Astley.—Habits in captivity with a colored plate of the male and female.

The Whinchat as a Song-bird. By W. E. Teschemaker.

Hooded and Golden-shouldered Parakeets. By Hubert D. Astley.—Discusses relationship of *Psephotus cucullatus* and *P. dissimilis*.

Other articles on *Columba albicularis* and Cranes.

Bulletin British Ornithologists' Club. No. CLXXXII, November 29, 1912.

New species described: *Acrocephalus tangorum* La Fouché, Chin-wang-tao, China; *Luscinola pryori sinensis* Witherby, Hankow, China; *Grallaria guatemalensis aripoensis* Hellmayr and Seilern, Trinidad; *Geotrygon linearis trinitatis* Hellmayr and Seilern, Trinidad; *Æthiopsar cristatellus formosanus* Hartert, Formosa; *Phasianus strauchi chonensis* Ogilvie Grant, Tau River, Kansu; *Poliospiza elgonensis* Ogilvie Grant, Mt. Elgon, British East Africa; *Campophaga martini* Jackson, Uganda.

Mr. Erwin Stresemann spoke on some parrots obtained on the second 'Freiburger Molukken-Expedition.' *Eos semilarvata* the habitat of which was unknown, was found at a high elevation in Ceram.

Mr. Ogilvie Grant discussed the differences in the scapular feathers of *Clangula* as a means of distinguishing the species.

Bulletin British Ornithologists' Club. CLXXXIII. December 27, 1912.

D. Seth Smith exhibited the downy young of *Larus hemprichi* which is pale buffy white, unspotted.

Hon. Walter Rothschild described *Fondia omissa* sp. n. from Madagascar.

Erwin Stresemann described *Abrornis sakaorum* sp. n. from the Malay Peninsula.

Bulletin British Ornithologists' Club. CLXXXIV. January 25, 1912.

Col. Stephenson Clarke gives an account of a trip to the Lorian, British East Africa, *Heterhyphantes golangi* (Mombasa) and *Laniarius quadricolor nigricauda* (Takaunga) are described as new.

D. A. Bannerman described *Hæmatopus niger meade-waldoi* subsp. n. from the eastern Canaries.

Stuart Baker described *Acanthopneuste trochiloides harterti* subsp. n. Assam Hills.

Tyto alba detorta subsp. n. from the Cape Verde Islands was described by Dr. Hartert.

The Emu. Report of the Twelfth Congress of the Royal Australasian Ornithologists' Union with the address of the new president, Mr. John White Mellor.

Mr. Mellor and Capt. S. A. White also present an account of a 'Camp-out' held on Cape Barren and Flinders Islands at the close of the session. Sixty-five species were observed, and *Falco melonotus*, *Megalurus flindersi* and *Sericornis flindersi* are described as new from the latter island. The authors appear to be in a quandary as to how to name subspecies, since resolutions were adopted by the Congress abolishing trinomials in the official Check List. So while binomial names are used in each of the above descriptions, the first is termed a 'sp. nov.' while the others are 'subsp. nov.' although of what they are subspecies we are not informed.

Other novelties named in the same way are *Cacomantis lineatus* sp. nov. by Alan P. Dodd, from Nelson; *Amytornis merrotsyi* sp. nov. by J. W.

Mellor, from Lake Torrens; *Acanthiza pygmaea* 'subsp. nov.' by A. W. Milligan, from the Mallee district of Victoria. Of only one of these six new forms is a type specimen mentioned. Even if trinomials are tabooed, we fail to see why our Australian confreres should not follow the modern custom of designating definite type specimens for each new form described. If this is not done it will occasion a great deal of trouble later on especially when we consider how rapidly new birds are being discovered.

Field Notes on the Emu Wren (*Stipiturus malachurus*). By Miss J. A. Fletcher.

Occurrence of *Cisticola* in Tasmania. By Miss J. A. Fletcher.

Notes on the Cassowary (*Casuarius australis*). By H. L. White. — A Valuable series of field notes with excellent half-tones of the nest and habitat.

Field Ornithology in South Australia. By Capt. S. A. White.

Birds of Port Germain, South Australia. By J. W. Mellor.

In 'Stray Feathers,' among various short notes, is a description by A. J. Campbell of a new bird, *Eopsaltria coomooboolaroo*, from the Dawson River district of Queensland.

At the close of the number is a Note on *Epthianura lovensis* Ashly. By Gregory M. Mathews with a colored frontispiece plate of this recently described bird. The author in the course of his remarks proposes to divide the genus *Epthianura* into four genera, of which *Parepthianura* for *E. tricolor*, and *Aurepthianura* for *E. aurifrons* and *E. tricolor*, are proposed as new.

The Austral Avian Record. Vol. I, No. 5. December 24, 1912.

Fourteen new subspecies of Australian birds and fifty-one new genera are proposed by Mr. Mathews. He also discusses the relationship of the avifauna of Lord Howe Island, regarding it as more closely related to New Caledonia than to New Zealand as had been recently claimed by W. R. B. Oliver; and contributes two short notes on a new Snipe for Australia and the use of the name *Coturnix ypsilophorus* for *C. australis*.

Prof. L. Brasil and Tom Iredale discuss the generic names *Antigone* and *Mathewsia*.

Robin Kemp describes three new subspecies of New Zealand Birds.

The Austral Avian Record. Vol. I, No. 6-7. February 28, 1913.

A List of the species of Australian Birds described by John Gould with the Location of the Type Specimens. By Witmer Stone, in conjunction with Gregory M. Mathews — This paper occupies the entire double number. It includes a brief history of the Gould Collection and aims to designate an individual type specimen for every new species described by Gould. The collection being at Philadelphia is inaccessible to the Australian Ornithologists and this catalogue will place at their disposal the more important data regarding the type specimens.

Revue Francaise d'Ornithologie. Vol. IV, No. 44. December 7, 1912.

European Birds of the Genus *Cyanecula*. By Dr. A. Dubois — Recognizes five forms.

- Common Buzzards in Captivity. By Maurice de la Fuye.
- Catalogue of Birds of Montlucon. By R. Villatte des Prugnes.— Includes dates of arrival and departure for 16 years.
- Revue Francaise d'Ornithologie.** Vol. V, No. 45. January 7, 1913. Ornithological Notes on the 'Alpilles' Region. By R. Deleuil.
- Protection of Birds in Madagascar. By L. Monnier.
- Revue Francaise d'Ornithologie.** Vol. V, No. 46. February 7, 1913. Remarks on the Nesting of the Coot (*Fulica atra*). By Paul Petitclerc.
- Wild Duck (*Anas boschas*) in male Plumage. By Eug. Lamoureux.
- Euethia olivacea* in captivity. By A. Decoux.
- Journal für Ornithologie.** January, 1913. Vol. 61, No. 1.
- On the Ornithology of Northwestern Mesopotamia and Interior Syria (concluded). By Hugo Weigold.
- A Contribution to the Distribution of Sea Birds. By R. Paëfslers.
- The Significance of Egg Shell Structure for the Systematist. By A. Szrelasko.— A microscopical study of the egg shells of European birds with excellent plates illustrating the several types of structure, accompanied by a discussion of the variability of measurements, and the type of shell structure for 54 species, based upon the examination of large series of each. An illustration of what 'oölogy' may lead to if studied scientifically.
- Aeronautical Experiments on the Height Limit of Flying Birds. By F. von Lucanus.
- On the Avifauna of South-eastern German East Africa (continued). By H. Grote.
- On the Avifauna of East and West Prussia. By H. G. von Schweppen-
burg.— List of 134 species.
- A Contribution to the Biology of *Urinator arcticus*. By O. Graf Zedlitz.
- Ornithologische Monatsberichte.** November, 1912.
- On the Geographical Distribution of the Birds of Russian Altai. By P. P. Suschkin.
- A New Flycatcher from the Island of Formosa. By A. Laubmann.—
Abrornis albigularis formosana subsp. nov.
- Dr. J. von Madarasz describes three new African forms; *Pinarochroa rudolphi*, Kilimanjaro; *Cisticola kmunkei*, Elgon; and *Bradypterus elgonensis*, Elgon.
- Is *Haliaeetus leucocephalus* ever seen in Europe? By H. Krohu.— Reviews alleged occurrences.
- Ornithologische Monatsberichte.** December, 1912.
- Circus approximans* Peale in Samoa. By J. Henniger.
- Ornithologische Monatsberichte.** January, 1913.
- Fighting House Sparrows. By R. Biedermann Imhoof.
- Two New Birds from Africa. By J. von Madarasz. *Cisticola elgonensis* Mt. Elgon and *Turtur electus* Maraquo, Abyssinia.
- Remarks on *Carduelis caniceps parapanisi* Koll. By P. Kollway.
- Upupa waibeli* n. sp. By A. Reichenow — From Camaroon.
- Lamprotornis corrusca* Nordm. an Older Name for *Lamprotornis melano-*
gaster Swains. By Oscar Neumann.

The names *Corvus sinensis* and *Corvus sibiricus*. By E. Stresemann — *C.* [= *Dendrocitta*] *sinensis* Lath. nec Gmel. is renamed *Dendrocitta formosæ sinica*. *C. corax sibiricus* Tacz. nec *C. sibiricus* Gmel. becomes *C. c. ussuriensis* Tacz.

Ornithologische Monatsberichte. February, 1913.

On the Biology of *Totanus fuscus*. By W. Hagen.

New Birds from Colombia. By J. von Madarasz.

Synallaxis fuscifrons and *Donacobius brachypterus* both from Aracatuca.

How is *Falco lanarius* Linne 1758 to be determined? By E. Lönnberg.

On the generic names, *Graucalus*, *Coracina*, *Calvifrons* and *Stoparola*.

By E. Stresemann.

Sylvia undata corsa subsp. nov. By A. Laubmann.—From Corsica.

Ornithologisches Jahrbuch. XXIII Jargang. Heft 5, 6. September–December, 1912.

Ornithological Observations on Hiddensöe Island during May and June, 1912. By C. Lindner.

Bird-life of the Gschnetzthal at Steinach, Tirol. By Otto von Wettstein.

Aviariae variae.—Biological Notes and Suggestions. By Dr. B. Placzek.

On the Wood Jays at Vienna in 1911–12. By Alfred Mintus.

Arrival and Departure Dates at Mariahof, 1911. By Jos. Noggler.

On Some Palaearctic Forms. By Viktor Ritter von Tschusi zu Schmidhoffen.

Riparia riparia fuscocollaris subsp. nov. Castelnovo, South Dalmatia;

Locustella fluviatilis obscura subsp. nov. Liman. Bosn. Gradiska;

Loxia curvirostra corsicana subsp. nov. Corsica and *Coturnix coturnix corsicana* subsp. nov. Corsica.

The Canary Islands. By R. von Thanner.

The Appearance of *Vultur monachus* in Switzerland. By Alb. Hess.

Ornithologische Monatsschrift. Vol. 37, No. 11 and 12. November and December, 1912.

No. 11. On the Songs of our Flycatchers. By B. Hoffmann.

No. 12. The spring Migration of the Stork and the Swallow.

Ardea. Vol. I, No. 3–4. December, 1912.

The Crested Lark at Ede. By J. L. F. De Meyere.

Varia oologica et nidologica. By A. A. van Pelt Lechner.

On the Rhinoceros Hornbill. By L. Baron van Heeckeren tot Waliën.

Some Observations on *Cygnus cygnus* L. By Dr. C. Kerbert.

Account of Ornithological Observations during a Seven Days' Residence on board the Lightship "Maas." By W. C. van Heurn.

Ornithological Observations in Netherland. By Dr. E. D. van Oort.

What Birds one would see on a Voyage to South America. By W. C. van Heurn.

Ornithological Articles in Other Journals.

Stubbs, F. J. A Contribution towards a Solution of the Problem of Migration. (The Zoölogist, No. 858, December 15, 1912) — Argues that "the present balance of life on the earth is made possible by the existence of a mobile mass of animal life flowing twice yearly from hemisphere to hemisphere."

Patten, C. J. Robins [English] on Migration, Observed at the Tuskar Rock Lighthouse (The Zoölogist, No. 859, January 15, 1913.)

Dewar, J. M. Further Observations on the Feeding Habits of the Oystercatcher (*Hematopus ostralegus*) (The Zoölogist, No. 860, February 15, 1913.)

Selous, Edmund. A Diary of Ornithological Observations made in Iceland during June and July, 1912. (The Zoölogist, No. 860, February 15, 1913.)

Criddle, N. New or Rare Bird Records from Manitoba, 1912 (The Ottawa Naturalist, January, 1913) — *Sayornis saya* taken at Aweme, April 23.

Saunders, W. E. Lincoln's Sparrow Nesting in Bruse County, Ontario (The Ottawa Naturalist, February, 1913.)

Brock, S. S. The Tufted Duck (*Fuligula cristata*) in the Nesting Season (The Scottish Naturalist, December, 1912).

Clarke, W. Eagle and the Duchess of Bedford. Notes on Migratory Birds Observed at Fair Isle, 1912. (The Scottish Naturalist, January and February, 1912.)

Thomson, A. L. Aberdeen University Bird-Migration Inquiry (1909-12). (The Scottish Naturalist, 19). — Many records of recapture of marked birds.

Seth-Smith, D. Exhibition of a female *Aix sponsa* which had partly assumed the plumage of the male (Abst. Proc. Zoöl. Soc. London, No. 115. February 4, 1913).

Rothschild, W. and Hartert, E. List of a Collection of Birds made by Mr. Albert Meek on the Kumusi River, N. E. British New Guinea (Novitates Zoöl. XIX, No. 2, 1912. pp. 187-206) — 119 species of which *Pitta mackloti oblita*, *Machaerirhynchus flaviventer novus*, *Coracina papuensis meekiana* and *Pinarolestes megarhynchus superfluus* are described as new.

Rothschild, W. and Hartert, E. List of Birds Collected by Mr. A. S. Meek at Haidana, N. E. British New Guinea (Nov. Zoöl. XIX, No. 2, pp. 207-209). — 33 species.

Hellmayr, C. E. Description of Two New Birds from the Timor Group of Islands. (Nov. Zoöl. XIX, No. 2, pp. 210-211) — *Dicaeum hanieli*, Bonleo, Timor and *Neopsittacus iris wetterensis*, Wetter Island.

Ingram, C. The Birds of Yunan. (Nov. Zoöl. XIX, No. 2, pp. 269-310) — 352 species of which, *Eudynamis orientalis harterti*, is described as new.

Stresemann, E. Ornithological Miscellany on the Indo-Australian Region (Nov. Zoöl. XIX, No. 2, pp. 311-351). — Includes reviews of (I)

the forms of *Lamprocorax metallicus*; (II) the genus *Gracula*; (III) *Anthus richardi*, of which *A. r. albidus*, So. Flores, is new; (IV) *Munia punctulata*, of which *M. p. blasii*, Flores, is new; (V) *Ploceus manyar*; (VI) *Pratincola caprata*, of which *P. c. albonotata*, Celebes, is new; (VII) *Phylloscopus trivirgatus parvirostris* subsp. n.; (VIII) genera *Siphia*, *Erythrosterna*, *Muscicapula*, *Dendrobiastes*, *Erythromyias*, *Digena*, *Anthipes*, *Cyornis*, and *Ochromela*; (IX) forms of *Dendrobiastes hyperythra*, *D. h. alefuris* subsp. n.; (X) forms of *Cacomantis merulinus*; (XI) geographic variation of *Centropus bengalensis*, *C. b. sarasinorum* subsp. n.; (XII) forms of *Eos bornea*, *E. b. rothschildi* subsp. n.; (XIII) genus *Phyllergates*; (XIV) *Criniger affinis harterti* subsp. n.; (XV) *Stegmatops indistincta* and *S. argentauris*; *S. i. nupta* Aru Isl., *S. a. patasiwa*, Ceram, subsp. n.; (XVI) *Zosterops palpebrosa*, *Z. p. harterti*, Alor, and *Z. p. foghaensis*, Buru., subsp. n.; (XVII) *Callocalia linchi*, *C. l. oberholseri* subsp. n.; (XVIII) *Callocalia franca*, *C. f. assimilis*, Fiji Isl. and *C. f. reichenowi*, Guadalcanar, subsp. n.

Cavazza, F. Study of systematic Variation in *Coturnix coturnix*. (Arch. Zool. Italiano, Vol. V, Naples, 1912).

Uchida, Seinosuke. A Hand List of Formosan Birds (Annot. Zoologicae Japonensis, VII, Pt. 1. Tokyo, 1912).—290 species with list of localities from which specimens have been examined and a table of distribution in neighboring regions.

Hesse, E. Critical Review of the *Picidae* based on the Material in the Royal Zoological Museum at Berlin. (Mitteilungen Zool. Mus. Berlin, Vol. VI, pt. 2, June, 1912).

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Cave, Walter A. The Birds of Colombo. (Spolia Zeylanica, Vol. VIII, June, 1912, Ceylon).—Fully annotated list, with plates from mounted specimens.

Gabriel, Joseph. Further Notes on the Mutton Birds (*Puffinus brevicaudus*) of Bass Straits. (Victorian Naturalist, Vol. XXVIII, No. 11. March, 1912).

Mathey-Dupray, A. Ornithological Notes on a Cruise to Spitzbergen. (Bull. Soc. Neuchat. Sci. Nat. Vol. XXXVIII, 1912).

Ekman, Sven. Are the Migration Routes of Birds the Original Lines of Dispersal of the Species? (Zool. Jahrbucher. (Syst. Geogr. n. Biol.) Vol. XXXIII, No. 6, Jena, 1912).—An important contribution to the study of migration, with detailed consideration of a number of Scandinavian species.

Ussher, R. J. Clare Island Survey, Part 20. Aves. (Proc. Royal Irish Academy, Vol. XXXI, 1912).—A fully annotated list of the birds of this interesting portion of west Ireland, with half-tone illustrations of the bird cliffs.

Sassi, Mariz. List of Birdskins from Mesopotamia. (Annalen K. K.

Naturhist. Hofmus. Wien, 1912, Vol. XXVI, No. 1-2.) — 53 species listed. An interesting plate shows a colony of Bee Eaters *Merops persicus*, the ground dotted with the entrances to the nest holes, resembling a Prairie Dog 'town.'

Herrera, A. L. Ornitologia Mexicana (La Naturaleza, Series III, Vol. I, No. 4, 1912) — An instalment concluding the Fringillidæ and beginning the Icteridæ. *Chrysomitris forreri* sp. nov. 'Ciudad en Durango.'

Alfaro, Anastasio El tijo tijo o Zopilotillo (*Crotophaga sulcirostris*) (Bolet. de Fomento, San José II, 1912).

Cole, Leon J. A Trematode Parasite of the English Sparrow in the United States. (Bull. Wisc. Nat. Hist. Soc., Vol. 9, pp. 42-48) — *Monostoma faba* forming tumor-like growths on the lower abdomen and hampering the flight. There is one previous record of its occurrence in the United States, in a Blue Jay.

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Gadow, H. On the Origin of Feathers (Archiv. f. Naturgesch. LXXVIII, 1912, pp. 210-217).

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Bent, A. C. A New Subspecies of Crossbill from Newfoundland (Smithson. Misc. Collus., 60, No. 15, December 12, 1912).

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(Fifty-ninth Annual Report of the State Board of Agriculture, Massachusetts. 1912).

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Forest and Stream, LXXX, 1-10.

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CORRESPONDENCE.

The Concealing Coloration Question.

EDITOR OF 'THE AUK':

Dear Sir:— I rise to a question of personal privilege. In the last number of 'The Auk' you as Editor and two correspondents take exception to certain expressions and certain statements contained in my paper on the Concealing Coloration question in the issue for October, 1912. Such of my language as is declared unparliamentary I gladly withdraw, and for it I tender my formal apologies. As a matter of fact, I did not realize that I was employing a different kind of language from what had been used by others in this discussion. The Editor of 'The Auk,' to be sure, cannot be held responsible in any way for Mr. Roosevelt's paper, which was published elsewhere, but at least one passage in that of Drs. Barbour and Phillips seems to me much more exceptionable than anything that my paper contained. However, bad examples are best not followed, and it would have been better to leave the facts to speak for themselves.

Dismissing the question of the objectionable expressions,— which, of course, I must regret since they have given offense to men whose good opinion I value highly,— I will take up the more serious counter-charges which have been made against me in defense of Mr. Roosevelt. And first I must plead guilty to an error of judgment in grouping 'misquotations,' etc., with 'pieces of faulty reasoning.' Never having had any notion of accusing Mr. Roosevelt of *intentional* misquotation, I carried all these things in my own mind as instances of carelessness and the like and assigned to each class an approximately equal degree of importance. I supposed that I was not including anything debatable in this category, but that the points I made would be instantly seen. In this it seems I was mistaken, and perhaps I gave my readers credit for a fuller knowledge of Mr. Thayer's views than they possessed. I now see my error in including two radically different classes of criticisms in the same category, and regret it exceedingly since it has apparently made a false impression on some readers. As a matter of fact, that sentence might quite as well have been omitted entirely, for I was willing to rest my case on the particular instances I cited.

And now I propose to prove to your entire satisfaction that the two examples of misquotation, or misapprehension, which you say 'cannot be so regarded' are actually what I have asserted them to be. You say: "Mr. Roosevelt was in the first instance not quoting Mr. Thayer verbatim regarding the crouching hare, and merely put in quotation marks some of Mr. Thayer's expressions. What Mr. Roosevelt was pointing out was that in one statement Mr. Thayer regards the running hare as obliterated in the sight of creeping animals, which have their eyes below the level of the hare's tail, while in another statement he regards the crouching hare as boldly conspicuous in the sight of the same class of animals, and this is surely what Mr. Thayer says." Now, I think that if any unbiased person will

read carefully the legend to Fig. 103 of Mr. Thayer's book and the text on page 153, which seem to be the only places in the book pertinent to the matter in hand, he will agree with me that this is a very ingenious explanation but hardly tenable. To assist readers in pursuit of the real facts in the case, I will point out that the words 'quadruped pursuer' do not occur on page 153, while they do occur in the legend to Fig. 103, only a few lines away from the statement in regard to the conspicuousness of the crouching hare 'when seen from the position of a mouse or cricket,' but in connection with the white rump of the leaping hare, and, so far as I can see, in no other place in the whole book. Now one can see in this proximity a very natural explanation of how a careless reader could read one expression in place of the other. If this explanation is incorrect, why, I ask, did Mr. Roosevelt use quotation marks for the expression 'quadruped pursuer'? It is commonplace enough in itself, and no one would think of putting it inside quotation marks except for some special purpose. Is it not obvious that Mr. Roosevelt thought he was virtually quoting Mr. Thayer's entire statement about the crouching hare? If he deliberately substituted the words 'quadruped pursuer' for 'mouse or cricket,' why did he not indicate that he was only drawing an inference, not making a quotation or even a paraphrase from Mr. Thayer, and why did he not use the term 'terrestrial enemies,' which he found ready to hand on page 153? But that Mr. Roosevelt has misread Mr. Thayer on this point is proved beyond a peradventure, it seems to me, by the fact that he goes on to say, "If a sitting rabbit is 'boldly conspicuous' to an animal on a level with it, then all of Mr. Thayer's theories go by the board at once, and all animals are always 'boldly conspicuous,' to their foes." Now Mr. Thayer did not say that the crouching hare was conspicuous to an animal, 'on a level with it' but 'from the position of a mouse or cricket,' which animals, of course, would look up at the hare and not view it from the same level. Mr. Roosevelt's attempt to show here that Mr. Thayer is inconsistent is surely a conspicuous failure, is it not? The trouble is that Mr. Roosevelt has in this and the other instance of misquotation, or misapprehension,— to which I shall proceed forthwith,— shown a signal lack of understanding of Mr. Thayer's contentions. If he had approached the book with a reasonable desire to find what there was of good in it, he would never have entertained the notion that Mr. Thayer regarded any crouching animal as conspicuous (in the long run) to its foes,— as if it were necessary for an animal to stand up in order to be obliterated. The whole argument of Mr. Thayer's book is in the opposite direction. It seems plain that Mr. Roosevelt not only misquoted Thayer's words in this instance but failed entirely to grasp the larger meaning of his book.

Now as to the other misreading of which I accuse Mr. Roosevelt, I must admit that, *as you put the case*, I may seem to have misjudged him. You will notice, however, on referring again to the passage you quote from Mr. Roosevelt, that though your footnote asserts that it is quoted verbatim, *you have omitted the very clause against which my criticism was directed!* That you are not unacquainted with the custom of inserting points to

indicate omissions is shown by the quotation thus abridged on the following page, and you must also be aware that it is not permissible to omit any vital part of a quotation, even though the omission be so indicated. (otherwise the points might be substituted for such a word as 'not,' for instance, and the quotation be made to read very differently from the original). This failure to quote the passage actually verbatim, since it has resulted in a serious misrepresentation of my side of the case, must be regretted, I am sure, as much by you as by me. What Mr. Roosevelt really says in the passage referred to — which you will find correctly quoted in my paper — is, "Mr. Thayer insists that the animal escapes observation, *not because its colors match its surroundings*, or because it sits motionless like a stump," etc. You omitted the words I have italicized and, as I have said, these were the very words I attacked. The omission was purely accidental, of course, for I am far from agreeing with Mr. Thomas Barbour that 'a misquotation would probably be wilful' (Auk, XXX, 82), but it was certainly unfortunate.

I think that you will now admit that my point against Mr. Roosevelt in this matter was well taken, but I will seize this opportunity to make the point so clear that no reader can fail to see it. To that end I will quote the same passage from Mr. Thayer's book which you quoted, condensed in the same way, but will italicize only certain words in it instead of the entire passage: "The reader . . . is now in a position to perceive the fallacy of the statement prevalent in former years and still made by certain writers, that a *protectively colored* animal of the type described above escapes detection because being of a dull brown color like the ground and the bushes, it looks when it sits motionless like a clod or a stump or some such inanimate thing. . . . The *protectively colored* animal, on the other hand, is as it were obliterated by its [= his] countergradation of shades. . . . If these animals were *merely* brown or gray like clods or stumps they would not be concealed, because their structural forms are too distinct, and the eyes of enemies are keen to detect their characteristic modelling and outlines. On the other hand, a perfect shade gradation, even of some rankly brilliant color, *would go far toward* concealing an animal." That is what Mr. Thayer says. Now, what does Mr. Roosevelt say? I will quote him again, verbatim, as I did in my paper, but italicizing the crucial portions: "Mr. Thayer insists that the animal escapes observation, *not because its colors match its surroundings*, or because it sits motionless like a stump, or clod, or some such inanimate thing, but *purely* because of its shading, which he says is rendered oblitative by the counter-gradation of shades." I might be content to let these two passages stand in the form of a 'deadly parallel', but experience teaches me that it is safer to make assurance doubly sure. I will draw attention again, therefore, to the fact that it is the *protectively colored* animal that is, according to Mr. Thayer, obliterated by its counter-shading, and other animals achieve only an approximation to that condition, for 'going far toward' concealment is by no means the same as reaching it. And it cannot be contended that in employing the words

'protectively colored' Mr. Thayer was writing loosely and had reference to the countershading itself. Mr. Thayer's book is not written in a loose way. It is a closely written book, on the contrary, and the words are chosen carefully. Mr. Thayer was laying stress on the office of countershading in the passage quoted. It doubtless never occurred to him that it would be necessary to argue for the efficacy of color-matching in concealment, nor could he have foreseen that he would be accused of ignoring it. If he had been arguing with any one who had the notion as to the all-powerfulness of countershading that Mr. Roosevelt has accused him of, he would doubtless have turned his statement about and have said that the countershaded animal is obliterated by its protective coloration, and that even without the countershading the background-matching 'would go far toward concealing an animal.'

You took an unusual course, Mr. Editor, in undertaking to apologize editorially for these two charges of mine against Mr. Roosevelt. Was it really so necessary? If you had been as intent on understanding Mr. Thayer as you have been on defending Mr. Roosevelt, might you not have reached a different conclusion as to the justice of my charges?

As to Mr. Chapman's communication, it seems to me that he is unnecessarily alarmed for the reputation of the bird-photographers. When I ventured the opinion that "the birds in most photographs do not appear at all as they would under average conditions in their natural surroundings," I had reference solely to this matter of conspicuousness. In general I think that bird photographs are of inestimable value to the student, since they show him some things which he could not possibly learn without them, and nothing could have been farther from my thoughts than to charge photographers with doing violence to nature in order to prove a point or make a pretty picture. It needs no extended argument, however, to prove that a bird in a picture, where the observer's eye is inevitably directed towards it, is in the nature of things much more easily to be seen than in the landscape out of doors,—as a general thing, I mean, for there are doubtless exceptions. Mr. Chapman himself says that "no doubt many bird photographs are made with the object of displaying their subject to the best advantage." I think he might have said 'most' instead of 'many' and still have kept within the bounds of truth, for is not that really the aim of most bird photographs,—to show the bird in its natural surroundings as clearly and completely as possible? And such photographs are so far from being 'lacking in scientific value' that their scientific value depends in great measure on their clearness in detail. When I said that the photographer avoided subjects that were obscured, I meant, of course, when he had before him a choice of individuals of the particular species he was desirous of photographing, and doubtless such choice is often unconscious. (Exception should perhaps be made of some of those "puzzle pictures" referred to by Mr. Chapman, where the definite object is to show the inconspicuousness of the bird.) I believe that photographers regard it as legitimate to cut away interfering twigs, etc., in order to reveal a

nesting bird, and this practice cannot be objected to, provided a statement is made that this was done; and yet in those cases the bird is undoubtedly rendered more conspicuous than it is under entirely natural conditions. So also with any bird that nests in the open, away from grass and foliage, the necessary nearness of the camera makes the bird inevitably more conspicuous, does it not? than it would be at a little distance. Now my contention — and I still think it a sound one — is that while some birds (as the woodcock) may be inconspicuous even under the disadvantage of occupying a comparatively large proportion of the field of view in a photograph, it is not sound reasoning to assert that all birds which are conspicuous in photographs are therefore necessarily so in nature. I see, however, that I shall have to acquit Mr. Roosevelt of any unusual degree of inaccuracy in this connection, since so distinguished a field ornithologist as Mr. Chapman supports him. As a matter of fact, though Mr. Chapman has appropriated my words 'inaccurate' and 'slap-dash' exclusively to the single instance of the photographs, this was but one of a number of cases which I thought showed these qualities in the aggregate. It stood first in the list because it came first in Mr. Roosevelt's paper.

Please understand that I am not now saying that Gannets, Murres, Guillemots, etc., are inconspicuous in the field, but simply that photographs alone cannot prove their conspicuousness. For one thing, it appears to me very probable that birds of large, bold patterns, such as most of these rock-nesting birds wear, need a greater distance to make operative whatever concealing power their coloration may have, and that birds that would appear conspicuous from the point of view of the camera might be by no means conspicuous at a greater, though not a great distance.

I have read with interest Mr. Thomas Barbour's latest contribution to this subject of Concealing Coloration (*Auk*, XXX, 81-91) and I am glad to see that he thinks he can distinguish common sense from superstition. I dare say, however, that many superstitious persons have been equally sure of their own common sense. The chief difficulty with Mr. Barbour appears to be that he does not perceive that common sense is a subjective quality and that it makes all the difference in the world whose common sense it is — whether that of a well-informed person like himself or Mr. Darwin (whom I quoted on the subject) or that of many a worthy day laborer who does n't know the meaning of the word 'science.' He does not, however, dispute my contention that something besides common sense is needed in discussing scientific questions and that there is such a thing as trusting it too implicitly, which after all was the only point I wished to make.

Now, taking up Mr. Barbour's criticisms seriatim and dealing with them as briefly as possible, after passing over the matter of the 'fifty instances,' etc., in which I have already confessed myself at fault in a certain measure, I come first to his statement that "a bird can be conspicuous in shape by being like a Scissor-tailed Flycatcher," which is certainly begging the question with a vengeance. I freely confess I have never seen a

Scissor-tailed Flycatcher in life, and I should very much appreciate it if Mr. Barbour, who has enjoyed that inestimable advantage, would take pity on my "ignorance,"—of just how one of these birds looks in its native haunts,—which is, of course, profound, and explain what makes it so conspicuous to him. I strongly mistrust that he is thinking of his own interest in seeing a bird of so *unusual* a shape rather than of the actual conspicuousness of the bird as a mere bird, an article of food for a predatory animal. For all I know, the Scissor-tailed Flycatcher may be a conspicuous bird in the field, but I venture to guess that if that is the case the reason will be found in its coloration and not in its form. As to the case of the cross fox, I am not now prepared to dispute Mr. Barbour's statement and I will therefore concede him and Mr. Roosevelt that one point! I think I can afford to, and still retain the best of the argument on these disputed cases. As to the possibility of any two species living under precisely the same conditions, I emphatically disagree with Mr. Barbour. Will he deny specifically that a difference in habit constitutes a difference in conditions? As to my opinion of the all-powerfulness of natural selection, he is certainly drawing on his imagination, for nowhere in my paper will he find any such opinion, expressed or implied. He has doubtless forgotten that at one point I argued for sexual selection and that I referred to Mr. Beebe's experiments, which have proved that moisture can virtually turn one species into another. I have no doubt, too, that species have occasionally arisen from mutations. The theorem of Le Chatelier, also, may be applicable, as the chemist W. D. Bancroft has suggested. I am willing, however, to rest on natural selection as the *chief* factor in speciation until a more plausible substitute is offered than has yet appeared.

As a parting fling, Mr. Barbour attributes to me a "desire to simply bolster up the arguments of a friend." In reply to this I must refer the reader to my already fully stated explanations of the object of my paper, and add that, though I should be proud to call Mr. Thayer my friend, my personal acquaintance with him is really very slight, and if I had followed the calls of friendship only, I should have been led in quite another direction. The paper was written entirely of my own motion, without consultation with Mr. Thayer, who never saw it till after it was published, and I alone am responsible for it.

Of the eight counts of my indictment against Mr. Roosevelt, two remain undisputed, and of the other six I think the present letter makes good my claims for all but a single and relatively unimportant one. I should also like to call attention to the fact that of the nineteen pages of my paper only four are devoted to adverse criticism of Mr. Roosevelt.

I am speaking to a question of personal privilege, and though on many accounts I should like to say something more on the larger and infinitely more important question of Concealing Coloration, I shall not stray from the point except to ask your indulgence for a few closing words of an impersonal nature addressed directly to the floor. I beg American ornithologists to study and experiment along these lines for themselves. I feel

very strongly that, whatever the final judgment upon Mr. Thayer's theories may be,—if there ever is a final judgment!—it will not be hastened by ignoring his work or by refusing to listen to his evidence. You will have to give up some preconceived ideas, well fortified behind 'common sense' though they may appear to be. You will have to admit among other things that, as the sky overhead is blue, the skyshine on the snow is blue, that the sky is lighter at the horizon than at the zenith, and that on a moonless night the sky is the lightest and therefore the whitest object to be seen. When you have examined Mr. Thayer's evidence impartially and understandingly, and have accepted the most of it, as I am sure you will do, then you will be in a much better position to arrive at a proper conclusion in regard to his theories than some of his most active critics are now in. I thank you, Mr. Editor and gentlemen.

Yours very truly,

FRANCIS H. ALLEN.

West Roxbury, Mass.

Feb. 14, 1913.

[The editor regrets exceedingly that in going through the press the clause, referred to was accidentally omitted from one of his quotations. He feels however that it in no way affects the point he was trying to make clear, i. e., that the one statement could not be called a misquotation of the other. Indeed in as much as the omission makes the two quotations *less* alike, it really weakens his contention.

As the discussion on Concealing Coloration has already been unduly prolonged it seems desirable to close it at this point.

WITMER STONE.]

NOTES AND NEWS.

On the 27th of January last the Union suffered the loss of one of its most distinguished and universally beloved foreign representatives. There passed away upon that date Professor Robert Collett, the Director of the Natural History Museum of Christiania, Norway, an author of many works, and a Corresponding Fellow of the American Ornithologists' Union since 1883.

Prof. Collett was born in Christiania on the 2d of December, 1842, and consequently he was, at the time of his death, in his 71st year. He was connected with many distinguished people of his own country, being the oldest son of Professor P. J. Collett and the widely known authoress Camilla Collett.

From his earliest boyhood his entire nature exhibited the unmistakable evidences of the coming naturalist, and, although never of a robust physique, or of the strenuous type, he won his title to fame through his supreme gentleness of manner and bearing, as well as through his nobleness of character and sterling qualities.

Academically, he received his education at the University of Christiania, while upon the other hand his ever increasing fund of knowledge was directly attributable to the tuition of that teacher of all teachers of every naturalist — Mother Nature.

His early attainments soon won position for him; in 1871 he became assistant curator of the Zoological Museum of Christiania, and three years later full curator of that institution. His country, too, was quick to recognize the marked value of his first contributions to the literature of zoological science, and, as his various works were published — chiefly on the Norwegian faunæ — honors, in the way of medals and degrees, were frequently bestowed upon him.

He became Director of the Zoological Museum of Christiania in 1882, and two years thereafter Professor of Zoölogy at the University.

Collett's first published paper dealt with the avifauna of the region in which the city of Christiania is situated, and this, as time went on, was followed by numerous and substantial contributions to almost every department of zoölogy, including the science of morphology. One of his best known achievements in the latter direction was a monograph upon the structure of the external parts of the ears of the *Strigida*. Professor Collett also gave us a number of excellent popular works upon Norwegian ornithology, and was a constant contributor to the zoological periodicals of his own and other countries.

Prof. Collett built up a superb and well stocked museum at Norway's capital. He published only recently an elegant volume on the Mammalia of his country, and at the time of his death was engaged upon the Reptilia; indeed, it was his intention to so treat the entire vertebrate fauna of Norway. — R. W. S.

IN the death of Chester A. Reed of Worcester, Mass., on December 16, 1912, the Union lost an Associate of much promise. While only thirty-six years of age Mr. Reed had already attained a wide reputation by his publications on popular bird study. He early conceived the idea that colored illustrations were the surest means of obtaining a familiarity with birds and in all his works, the furnishing of adequate illustrations was the chief aim.

In the use both of the camera and the brush he had acquired great skill and his efforts have contributed not a little to the spread of the popular knowledge of bird life which has marked the past few years. His most notable publications have been his 'Bird Guide'; 'Flower Guide'; 'North American Birds' Eggs'; 'Birds of Eastern North America'; 'Nature Studies in Field and Wood'; and 'Camera Studies of Wild Birds.'

WILLIAM BERNHARD TEGETMEIER, the English ornithologist, died on November 20, 1912, at the age of 96 years. He was born in Buckinghamshire, November 4, 1816, and was noted for his investigations on the breeding of Pigeons, Poultry and Pheasants. He was a correspondent of Darwin and furnished him with much information derived from his experiments in breeding and variation.

At the 30th annual meeting of the American Ornithologists' Union, held in Cambridge, Mass., November 11, 1912, it was voted to publish an index to the volumes of 'The Auk' from 1901-1910, inclusive, and the appointment of a committee to undertake the work was authorized. The President has appointed Dr. T. S. Palmer as Chairman with authority to select the members of the committee. Dr. Palmer informs us that the Index Committee as at present organized comprises:

Dr. T. S. Palmer, Chairman; Prof. W. W. Cooke, Secretary; Dr. A. K. Fisher, N. Hollister, A. B. Howell, A. H. Howell, D. E. Lantz, H. H. T. Jackson, W. L. McAtee, Gerrit S. Miller, Jr., E. A. Preble, J. H. Riley, and John G. Tyler. The work, he states, has been divided so that ten of the members will do the actual indexing and the other three will prepare the copy for the press. The plan of this index is the same as that of the 25-year index published in 1907. It is expected that the same high standard of completeness and accuracy will be maintained and with much less labor than was necessary in the preparation of the larger work. The Biological Survey already has the material for a 10-year index on cards prepared by Prof. Cooke. These cards have been divided among the indexers, the entries for one volume being given each member to check with the text and make any necessary additions or corrections. The cards are then to be returned to the secretary who will rearrange them in a single alphabet and prepare the final copy for the printer. This copy will then be divided into 10 equal parts and given to the indexers a second time before being sent to press. In this way much of the arduous labor of writing cards can be avoided and the entries checked twice with a minimum of effort.

The work is already well under way and one fourth of the cards have been returned to the secretary. It is expected that all will be returned by May 1 and that the final copy can be prepared, verified, and made ready for the press before the next annual meeting.

AN editorial in a recent number of the 'Wilson Bulletin' contemplates the organization of an Ornithological Society — or rather the extension of the existing Wilson Club — to cover the Interior states and to hold annual meetings for the purpose of bringing the members into close personal touch. It seems to us that such a movement cannot be too strongly commended, the one weak point in the organization of the Wilson Club has always seemed to be this lack of personal contact, which is all important in stimulating ornithological activity.

The geographic arrangement of Ornithological Societies mentioned in the closing paragraph does not, however, seem to us a very happy one, *i. e.* "The Cooper Club on the Pacific side, the A. O. U. on the Atlantic, and the Wilson Club in the Interior." The A. O. U. is in no sense local in its activities and it draws its strength from the Pacific and Interior states as well as from the Atlantic coast. The holding of its meetings in the east has been because the great majority of active ornithologists are located there and almost all the invitations for holding the annual meetings have come from eastern cities. Moreover the burden imposed upon the local members on such occasions is unfortunately considerable and makes it difficult to entertain the Union except in cities where there are a large number of resident members.

A better grouping would we think be: "The Cooper Club on the Pacific side, the Wilson Club in the Interior and the Nuttall and Delaware Valley Clubs in the east; with the A. O. U. covering all three districts and meeting now in one and now in another, according to the invitations received and the number of active ornithologists who could be guaranteed to be in attendance. For some time to come the A. O. U. meetings will probably be held mainly in the east for the reasons already cited, but the proposed activity of the Wilson Club would we feel sure, soon result in invitations to meet somewhere in the interior which would, we have no doubt, be promptly accepted. The Cooper Club has already successfully managed one A. O. U. meeting on 'the coast' and bids fair to duplicate it in the near future.

Meanwhile an Annual meeting of the Wilson Club will undoubtedly draw the ornithologists of the interior states into close association and if held at a time other than that of the A. O. U. meeting will ensure them an opportunity for personal contact without conflicting with the more general gathering. The movement will also concentrate their energies and resources so that an A. O. U. meeting in one of the Interior states will we trust, be an event of the near future.

MESSRS. F. M. Chapman and Louis Agassiz Fuertes with four assistants, sailed for Colombia on January 8, to continue their explorations of the avifauna of that country in the interests of the American Museum of Natural History. They expect to make collections in the vicinity of Bogota and then cross the mountains to the east and descend into the headwaters of the Orinoco, thus connecting their previous work in western Colombia with that now being prosecuted by another party in the Orinoco drainage, and making as it were an ornithological cross section of the country.

UNUSUAL activity in game legislation has been manifest this winter and Dr. T. S. Palmer of the U. S. Biological Survey has sent us the following summary of this work:— Since the beginning of the year Congress and the legislatures of 41 States have been in session, and the total number of game bills under consideration is probably between 400 and 500. The average of 10 such bills per State is reduced to one in some cases and in others as in Connecticut increased to nearly 60, and in California to 93. The fate of many of these measures is still uncertain. At this date, March 15, Congress and the legislatures of Indiana, Oregon, South Carolina, South Dakota, Vermont, West Virginia, and Wyoming have adjourned and their record is closed.

The great event of the year is the passage of the Federal migratory bird bill as an amendment to the Agricultural Appropriation bill on the last day of the session. This measure has been before Congress for more than eight years, and during the past year a campaign for its enactment unequalled in the history of game legislation has been waged by the American Game Protective Association, the National Association of Audubon Societies, and other friends of wild life conservation. As finally enacted it differs but slightly from the bill originally introduced by Hon. George Shiras, 3d, in December, 1904, and authorizes the Department of Agriculture to fix seasons for migratory game and insectivorous birds, and imposes a maximum penalty of \$100 fine or 90 days imprisonment for killing such birds out of season. On March 3, the day before his retirement, President Taft signed an order making the Aleutian Islands, Alaska, a reservation in charge of the Departments of Agriculture and Commerce. This reservation, the 61st in the list of National Bird Refuges and one of the largest, includes all the islands from Unimak west to Attu. Congress has been preparing for new tariff legislation and during the hearings before the Ways and Means Committee of the House on January 30, Dr. W. T. Hornaday, representing the New York Zoological Society, Mr. T. Gilbert Pearson, Secretary of the National Association of Audubon Societies, and Dr. George W. Field, Chairman of the Massachusetts Fish and Game Commission, urged the amendment of Schedule N so as to prohibit the importation into the United States of the plumage of wild birds. The result of their efforts is still uncertain as the bill will not be reported until the special session in April.

In the State legislatures plumage bills similar to the New York Shea

law have been introduced in Indiana and Pennsylvania (S. 46) and have passed one branch of the legislature with a fair chance of enactment in spite of the active opposition of the millinery interests. Among other measures of special interest to ornithologists may be mentioned the Tennessee law removing the Robin from the game list, the Pennsylvania bill (S. 45) protecting the Dove, Killdeer and Blackbird throughout the year which had passed, the California bill placing Wild pigeons, Doves, and all *Limicolæ* on the nongame list (S. 1190), the bills in Connecticut (H. 222) and New Jersey (A. 206) removing protection from the Starling, and the effort in Connecticut to restore the provision for issuing permits for scientific collecting. Oregon has established several important State game preserves and revised her entire game law, Vermont has likewise adopted an entirely new game code, and Wyoming has stopped spring shooting of ducks and geese (S. F. 11).

The usual number of bills permitting spring shooting has been introduced especially in Connecticut, New York, and Colorado, but in Wisconsin the measure met a decisive defeat in the Assembly Committee. Texas is considering the withdrawal of protection from pelicans and certain other fish-eating birds. Connecticut, Massachusetts, Michigan, Ohio, and South Dakota are struggling with the question of reorganization of their game departments, and California has under consideration several freak bills, one of which (A. 287) proposes to divide the State into 58 game districts, one for each county, and another (A. 1992) to make every member of the legislature a game warden who shall serve without compensation.

We learn from the Press Bulletin of the Canadian Department of Mines that the Victoria Memorial Museum has just received a fine collection of several hundred Canadian birds, the gift of Mr. J. H. Fleming. The specimens are said to constitute one of the best mounted collections in Canada.

A CIRCULAR issued by the editor of 'British Birds' states that the readers of this magazine have placed over 32,000 rings on wild birds of various kinds. The most striking of the numerous 'return records' that have been received is that of a Swallow, banded by Mr. J. R. B. Masefield at Rosehill Cheadle, Staffordshire, England, May 6, 1911, and found near Utrecht, Natal, South Africa, on December 23, 1912.

AT the annual meeting of the Royal Australasian Ornithologists' Union the Check List Committee, which has for some years been engaged in preparing a list of Australian birds, presented its report. The facts that trinomials are rejected, and that the principle of priority is not carried farther back than the dates contained in the works of John Gould, will demonstrate how absolutely this list will differ from the recent list published by Mr. Gregory M. Mathews.

We fear that Australian Ornithologists are not advancing the interests

of systematic ornithology by adopting such rules as the above. We are already seeing evidence of the dilemma in which the rejection of trinomials has placed them, when we find in their latest publications some new binomial names denoted as species and others as subspecies! The publication of the Check List will be looked forward to with much interest.

THE twenty-third annual meeting of the Delaware Valley Ornithological Club was held at the Academy of Natural Sciences, Philadelphia, on January 2, 1913. The officers elected for the ensuing year were: President, Stewardson Brown; Vice-President, Henry W. Fowler; Secretary, J. Fletcher Street and Treasurer, Samuel C. Palmer; Robert T. Moore continues as editor of *Cassinia*.

Some of the more important communications presented before the Club during the year were: A Trip to the Magdalen Islands, by W. L. Bailey; A Trip to Ecuador with Special Reference to the Tierra Templada, by Samuel N. Rhoads; The Classification of Birds, by Spencer Trotter, M. D.; Summer Birds of McKenzie Pond, Adirondacks, by E. L. Poole; and The Embryology of a Bird, by Samuel C. Palmer.

THE J. P. Bell Co., Lynchburg, Va., announces the early publication of a work on 'The Breeding Birds of Virginia,' by Mr. Harold H. Bailey. The volume will comprise about 300 pages of text with 14 colored plates and one hundred half-tones. The edition will be limited and orders should be sent to H. H. Bailey, Newport News, Va., Price, exclusive of postage \$3.

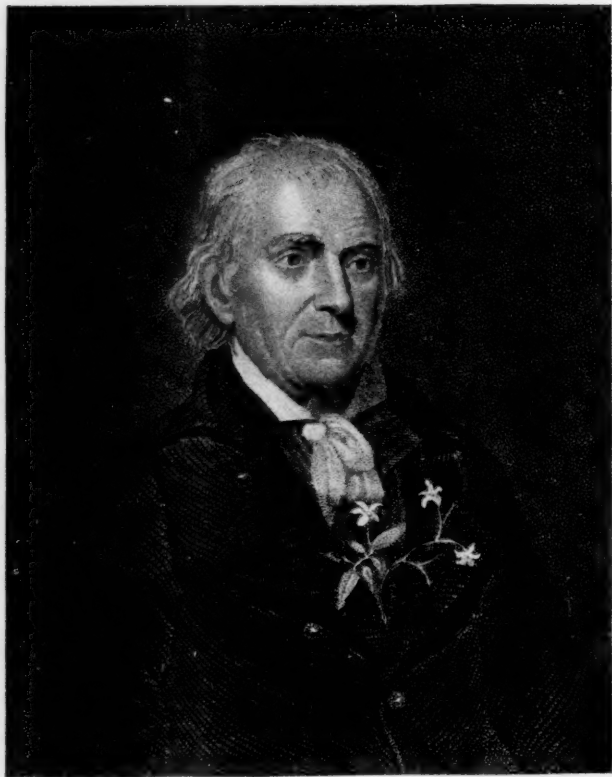
MESSRS. WITHERBY & Co. are shortly publishing for Mr. H. Kirke Swann 'A Dictionary of English and Folk-Names of British Birds,' which will contain some five thousand names with their meanings and localities as well as much information on the Folk-Lore, Weather-Lore, and Legends connected with birds.

JUST as we go to press we have received a copy of Mr. Robert Ridgway's long expected Color Book under the title 'Color Standards and Color Nomenclature.' Washington, D. C. Published by the Author. \$8. (cash with order), postage extra, registered 20 cts.

The work consists of forty-three pages of text and fifty-three colored plates depicting 1115 named colors! Besides furnishing an indispensable standard of colors for naturalists and others who have to deal with fine gradations of tints it constitutes a thoroughly scientific presentation of the entire subject of colors and their relationship.

DR. J. A. ALLEN of the American Museum of Natural History, formerly editor of 'The Auk,' sailed for Europe last month as one of the American delegates to the Ninth International Zoölogical Congress, to be held at

Monaco, March 25-29. One of the most important questions likely to be brought before the Congress for discussion, and one in which Dr. Allen is deeply interested, is the proposition to depart from the rule of absolute priority in regard to generic and specific names. We trust that no change in the rules bearing upon this matter will be authorized and that the painstaking work of the Commission toward a uniform standard nomenclature may be allowed to proceed unhampered.



Will. Bartram

From Welch's Engraving of the Portrait by Peale.